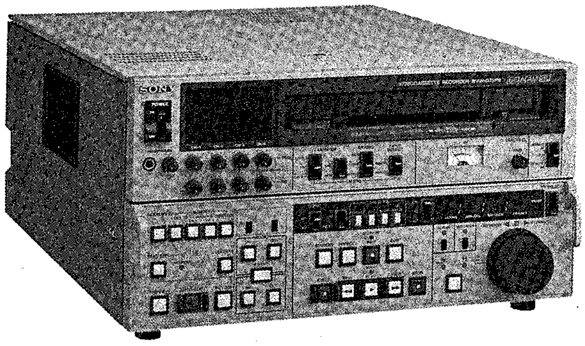
SONY®

VIDEOCASSETTE RECORDER

BVW-D75PS



BETACAM SP™

MAINTENANCE MANUAL
Volume 1 1st Edition (Revised 2)
Serial No. 10001 and Higher

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Volume 2

12. BLOCK DIAGRAM
13. PRINTED WIRING BOARD LAYOUT
14. SCHEMATIC DIAGRAM
15. SEMICONDUCTOR PIN ASSIGNMENT
16. REPLACEABLE PART AND OPTIONAL FIXTURE

SECTION 1
INSTALLATION

Be sure to install the BVW-D75PS in locations satisfying the required operational environment described below to assure the BVW-D75PS's superior performance and to maintain the excellent serviceability and accessibility.

1-1. OPERATIONAL ENVIRONMENT

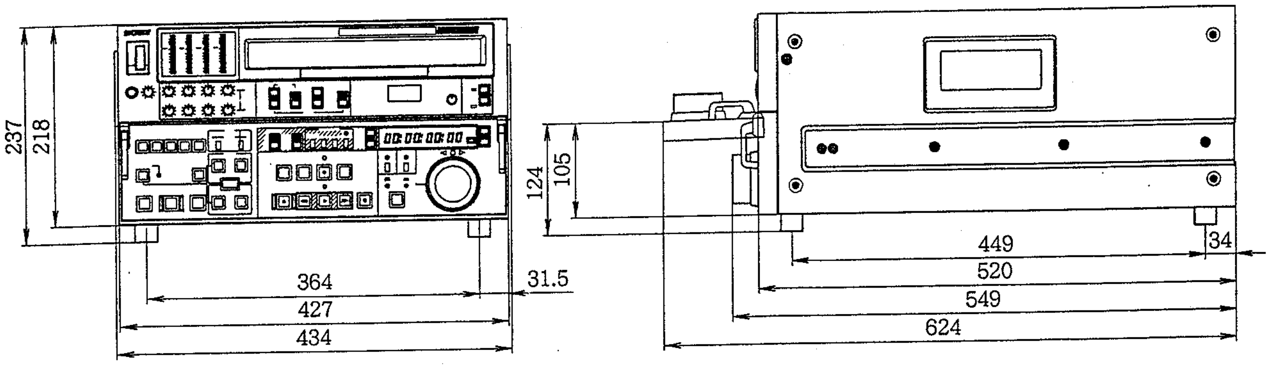
- Operating temperature :
  5℃ to 40℃
  (Good air circulation is essential to prevent internal heat build-up. Place the unit in a location with sufficient air circulation. Do not block the ventilation holes on the cabinet and the rear panel.)
- Storage temperature :
  −20℃ to +60℃
- Locations to avoid :
  - . Areas where the unit will be exposed to direct sunlight or any other strong lights.
  - . Dusty areas or areas where it is subject to vibration.
  - . Areas with strong electric or magnetic fields.
  - . Areas near heat sources.

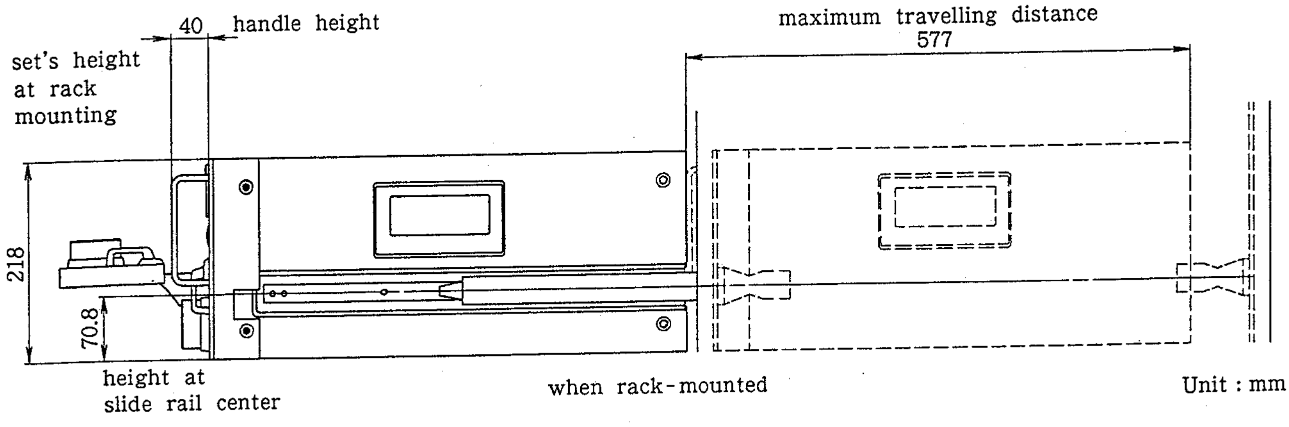
1-2. INSTALLATION

1-2-1. Installation Space

(1) The outer dimensions of the unit are shown in the figure below. The rear side must be at least 40 cm from the wall for ventilation and maintenance.

(2) When the unit is operated on a desk or similar condition, assure that the clearance above the unit is at least 40 cm to provide accessibility to the printed circuit boards and other mechanical parts. Note that it is not necessary to provide the space when the unit is mounted in a rack since the printed circuit boards can be repaired after it is pulled out.


237
218
364
427
434
31.5
124
105
449
34
520
549
624


40
handle height
set's height at rack mounting
218
70.8
height at slide rail center
maximum travelling distance
577
when rack-mounted

Unit : mm

1-2-2. Installation Setup and Adjustment

When installing, be sure to perform the following setup and adjustment items.

- Control panel

(1) In case of performing time code editing.
    1. Time code reader setting
    2. Time code generator setting
(2) In case of using as editing system.
    SYNC phase adjustment

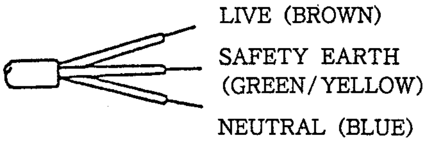
- Connector panel
    Audio input level select switch setting

1-3. OPERATING VOLTAGE

Power voltage : 90 V to 265 V
Power frequency : 48 Hz to 64 Hz
Power consumption : 210 W

Note : Power Cord

Approx. 2.4 m in length



1-4. CONNECTION CONNECTORS

When external cables are connected to the various connectors on the connector panel during maintenance, the hardware listed below (or equivalents) must be used.

DIGITAL I/O

BVW-D75PS Connector Panel Indication	Matching Connectors/Cables Connectors Sony Part No.
SERIAL V/A INPUT	BNC, MALE 1-560-069-11
SERIAL V/A OUTPUT	BNC, MALE 1-560-069-11
AUDIO INPUT CH-1/CH-2, CH-3/CH-4	XLR 3P, MALE 1-508-084-00
AUDIO OUTPUT CH-1/CH-2, CH-3/CH-4	XLR 3P, FEMALE 1-508-083-00
TIME CODE IN	XLR 3P, MALE 1-508-084-00
TIME CODE OUT	XLR 3P, FEMALE 1-508-083-00

ANALOG I/O

BVW-D75PS Connector Panel Indication	Matching Connectors/Cables Connectors Sony Part No.
REF VIDEO INPUT	BNC, MALE 1-560-069-11
MONITOR OUTPUT	BNC, MALE 1-560-069-11
AUDIO INPUT CH-1, CH-2, CH-3, CH-4	XLR 3P, MALE 1-508-084-00
AUDIO OUTPUT CH-1, CH-2, CH-3, CH-4	XLR 3P, FEMALE 1-508-083-00
AUDIO SELECTED OUT CH-1/CH-3, CH-2/CH-4	XLR 3P, FEMALE 1-508-083-00

REMOTE

BVW-D75PS Connector Panel Indication	Matching Connectors/Cables Connectors Sony Part No.
TBC REMOTE	CONNECTOR, 15P, FEMALE and JUNCTION SHELL 1-561-610-21 1-561-929-00
REMOTE-1 IN (9P)	JUNCTION SHELL, 9P and CONNECTOR, 9P (M) 1-561-749-00 1-560-651-00 Optional cable : RCC-5G (5 m) RCC-10G (10 m) RCC-30G (30 m)
REMOTE-1 OUT (9P)	JUNCTION SHELL, 9P and CONNECTOR, 9P (M) 1-561-749-00 1-560-651-00 Optional cable : RCC-5G (5 m) RCC-10G (10 m) RCC-30G (30 m)
KY REMOTE	CONNECTOR, 15P, MALE 1-566-355-11 or 1-566-355-21
REMOTE-2 (36P)	CONNECTOR, 36P, MALE 1-508-852-00

1-5. INPUT/OUTPUT SIGNALS OF THE CONNECTOR

INPUT

REF VIDEO IN : BNC × 2 (for bridging connection)
Black burst or 1.0 Vp-p ±3.0 dB, 75 ohms, sync negative

DIGITAL SERIAL V/A IN : BNC × 2 (for active loop-through)
0.8 Vp-p, 75 ohms

DIGITAL AUDIO IN CH-1/CH-2, CH-3/CH-4 : XLR 3P × 2 (female)
AES/EBU format, balanced

ANALOG AUDIO IN CH-1/2/3/4 : XLR 3P × 4 (female)
LOW : −60 dBm, 600 ohms (or 3 k ohms), balanced
HIGH : +4 dBm, 600 ohms (or 10 k ohms), balanced

TIME CODE IN : XLR 3P (female)
0.5 to 18 Vp-p, 10 k ohms, balanced

OUTPUT

DIGITAL SERIAL V/A OUT : BNC × 4
0.8 Vp-p, 75 ohms

DIGITAL AUDIO OUT CH-1/CH-2, CH-3/CH-4 : XLR 3P × 2 (male)
AES/EBU format, balanced

ANALOG AUDIO OUT CH-1/2/3/4 : XLR 3P × 4 (male)
+4 dBm (600-ohm load), low impedance, balanced

AUDIO SELECTED OUT: XLR 3P × 2 (male)
+4 dBm (600-ohm load), low impedance, balanced

TIME CODE OUT : XLR 3P (male)
2.2 Vp-p, (600-ohm load) balanced
low impedance, balanced

MONITOR OUTPUT : BNC × 3
Y : 1.0 Vp-p 75 ohms sync negative
R-Y : 0.7 Vp-p 75 ohms (100/7.5/77/7.5 color-bar)
B-Y : 0.7 Vp-p 75 ohms (100/7.5/77/7.5 color-bar)

HEADPHONES : JM-60 stereo phone jack
−∞ to −12 dBm (8-ohm load), unbalanced.

TBC REMOTE : 15P (male)

Pin No.	Description	Operating Voltage	IN/OUT
1	SYNC CONTROL	−5 V to +5 V	IN
2	HUE CONTROL	−5 V to +5 V	IN
3	SC CONTROL	−5 V to +5 V	IN
4	VIDEO LEVEL CONTROL	−5 V to +5 V	IN
5	SETUP CONTROL	−5 V to +5 V	IN
6	CHROMA LEVEL CONTROL	−5 V to +5 V	IN
7	−12 V	−12 V	OUT
8	GND	——	IN/OUT
9	FRAME GND	——	IN/OUT
10	NC	——	—
11	NC	——	—
12	NC	——	—
13	Y/C DELAY CONTROL	−5 V to +5 V	IN
14	NC	——	—
15	+12 V	+12 V	OUT

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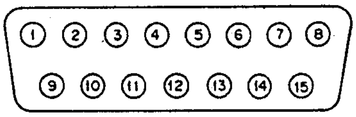
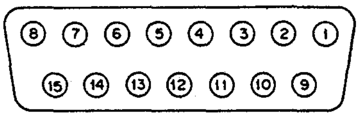


TBC REMOTE

KY REMOTE : 15P (female)

Pin No.	Description
1	L : KEY BOARD TEST OUT
2	KEY SERIAL STATUS IN
3	NC
4	REG 8V OUT
5	REG 8V OUT
6	REG 8V OUT
7	NC
8	NC
9	NC
10	KEY SERIAL COMMAND OUT
11	NC
12	———
13	GND
14	GND
15	GND

< External view >



KY REMOTE

REMOTE-1 IN (9P) / OUT (9P)

Pin No.	Controlling Device	Controlled Device
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground

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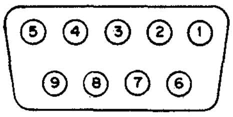
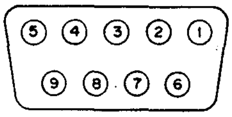


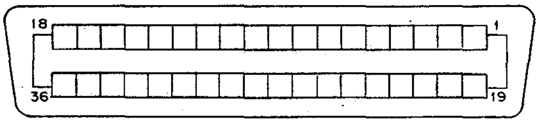
REMOTE-IN (9P)



REMOTE-OUT (9P)

REMOTE-2 : 36P (female)

Pin No.	Description	Level
1	REG 5 V	TTL
2	L-FF COMMAND IN	TTL
3	L-FWD COMMAND IN	TTL
4	L-REW COMMAND IN	TTL
5	L-EJECT COMMAND IN	TTL
6	L-STOP COMMAND IN	TTL
7	L-PAUSE COMMAND IN	TTL
8	L-REC COMMAND IN	TTL
9	L-CUT IN COMMAND IN	TTL
10	L-EDT COMMAND IN	TTL
11	L-CUT OUT COMMAND IN	TTL
12	L-FF STATUS OUT	TTL
13	L-FWD STATUS OUT	TTL
14	L-REW STATUS OUT	TTL
15	L-STANDBY STATUS OUT	TTL
16	L-STOP STATUS OUT	TTL
17	L-PAUSE STATUS 1 IN/OUT	TTL
18	L-REC STATUS OUT	TTL
19	L-INSERT STATUS OUT	TTL
20	L-VIDEO INSERT IN	TTL
21	L-AUDIO-1 INSERT IN	TTL
22	L-AUDIO-2 INSERT IN	TTL
23	L-REVERSE COMMAND IN	TTL
24	SPEED A IN	TTL
25	SPEED B IN	TTL
26	L-CTL PULSE OUT	TTL
27	L-TACH OUT	TTL
28	L-CAPSTAN LOCK OUT	TTL
29	SYNCHRONIZE IN	3.0 V ; 0 % −0.3 V ; −10 to −15 % +6 V ; +10 to +15 %
30	L-STILL TENSION IN	———
31	H-NORMAL FWD IN	TTL
32	L-PAUSE STATUS 2 OUT	TTL
33	L-SEARCH STATUS IN	TTL
34	NC	———
35	GND	———
36	GND	———



REMOTE-2 (36P)

1-6. BOARD SWITCH AND SHORT PIN SETTING

CP-175 BOARD SWITCH/SHORT PIN

No.	NAME	DESCRIPTION	FACTORY SETTING
S101	CH1 INPUT TERMINATION	AUDIO CH1 INPUT TERMINATION 600 Ω ON/OFF SWITCH	ON
S201	CH2 INPUT TERMINATION	AUDIO CH2 INPUT TERMINATION 600 Ω ON/OFF SWITCH	ON
S301	CH3 INPUT TERMINATION	AUDIO CH3 INPUT TERMINATION 600 Ω ON/OFF SWITCH	ON
S401	CH4 INPUT TERMINATION	AUDIO CH4 INPUT TERMINATION 600 Ω ON/OFF SWITCH	ON
S102	CH1 INPUT LEVEL	AUDIO CH1 INPUT LEVEL HIGH/LOW SWITCH	HIGH
S202	CH2 INPUT LEVEL	AUDIO CH2 INPUT LEVEL HIGH/LOW SWITCH	HIGH
S302	CH3 INPUT LEVEL	AUDIO CH3 INPUT LEVEL HIGH/LOW SWITCH	HIGH
S402	CH4 INPUT LEVEL	AUDIO CH4 INPUT LEVEL HIGH/LOW SWITCH	HIGH
COR101	CH1 INPUT REF. LEVEL	AUDIO CH1 INPUT REF. LEVEL SELECTION +4 dB/+0 dB/−3 dB/−20 dB	+4 dB
COR201	CH2 INPUT REF. LEVEL	AUDIO CH2 INPUT REF. LEVEL SELECTION +4 dB/+0 dB/−3 dB/−20 dB	+4 dB
COR301	CH3 INPUT REF. LEVEL	AUDIO CH3 INPUT REF. LEVEL SELECTION +4 dB/+0 dB/−3 dB/−20 dB	+4 dB
COR401	CH4 INPUT REF. LEVEL	AUDIO CH4 INPUT REF. LEVEL SELECTION +4 dB/+0 dB/−3 dB/−20 dB	+4 dB

AU-147P BOARD SHORT PIN

No.	NAME	DESCRIPTION	FACTORY SETTING
COR631	CH1 ERASE	SHORT : AUDIO CH1 ERASE ON OPEN : AUDIO CH1 ERASE OFF	SHORT
COR651	CH2 ERASE	SHORT : AUDIO CH2 ERASE ON OPEN : AUDIO CH2 ERASE OFF	SHORT
COR671	T/C ERASE	SHORT : TIME CODE ERASE ON OPEN : TIME CODE ERASE OFF	SHORT
COR901	DOLBY ON	SHORT : DOLBY ON OPEN : DOLBY OFF	SHORT

AU-145 BOARD SHORT PIN

No.	NAME	DESCRIPTION	FACTORY SETTING
COR101	CH1 OUTPUT REF. LEVEL	AUDIO CH1 OUTPUT REF. LEVEL SELECTION +4 dB/-20 dB/-3 dB/0 dB/+8 dB	+4 dB
COR201	CH2 OUTPUT REF. LEVEL	AUDIO CH2 OUTPUT REF. LEVEL SELECTION +4 dB/-20 dB/-3 dB/0 dB/+8 dB	+4 dB
COR301	CH3 OUTPUT REF. LEVEL	AUDIO CH3 OUTPUT REF. LEVEL SELECTION +4 dB/-20 dB/-3 dB/0 dB/+8 dB	+ 4 dB
COR401	CH4 OUTPUT REF. LEVEL	AUDIO CH4 OUTPUT REF. LEVEL SELECTION +4 dB/-20 dB/-3 dB/0 dB/+8 dB	+4 dB
COR501	MONITOR CH1 REF. LEVEL	AUDIO MONITOR CH1 OUTPUT REF. LEVEL SELECTION +4 dB/-20 dB/-3 dB/0 dB/+8 dB	+4 dB
COR601	MONITOR CH2 REF. LEVEL	AUDIO MONITOR CH2 OUTPUT REF. LEVEL SELECTION +4 dB/-20 dB/-3 dB/0 dB/+8 dB	+4 dB

AU-146P BOARD SWITCH/SHORT PIN

No.	NAME	DESCRIPTION	FACTORY SETTING
S901	FORCIBLE CONFI	ON : Forcible audio confi mode OFF : Normal mode	OFF
COR901	MONITOR LEVEL FIX	SHORT : AUDIO MONITOR level is selectable in accordance with SETUP MENU ITEM 114 setting, to fixed level or variable level using HEADPHONES level control. OPEN : AUDIO MONITOR level is fixed.	SHORT

AFM-8 BOARD SWITCH

No.	NAME	DESCRIPTION	FACTORY SETTING
S1	AFM CARRIER MUTE	ON : AFM recording disable. OFF : AFM recording enable.	OFF

DP-128 BOARD SWITCH (Fluorescent display tube switch)

No.	NAME	DESCRIPTION	FACTORY SETTING
S101	SCALE SWITCH	VU : Scale of audio level meter indicates with VU dB : Scale of audio level meter indicates with dB	VU
S102	TEST	ON : All fluorescent display lights up. OFF : Normal mode	OFF

RP-53P BOARD SWITCH

No.	NAME	DESCRIPTION	FACTORY SETTING
S1	INPUT RF SWITCH	ON : Normal mode OFF : REC RF signal from MDM-5 board turns OFF, and RF signal can supply from the external signal generator. (Input terminal : Y : TP2, C : TP102)	ON
S2	Y-A REC CURRENT	ON : Normal mode OFF : Y-Ach record current measuring mode (Measuring point : Short between TP7 and TP8 with shorting lead, and connect current probe to it.)	ON
S3	Y-B REC CURRENT	ON : Normal mode OFF : Y-Bch record current measuring mode (Measuring point : Short between TP9 and TP10 with shorting lead, and connect current probe to it.)	ON
S101	C-A REC CURRENT	ON : Normal mode OFF : C-Ach record current measuring mode (Measuring point : Short between TP107 and TP108 with shorting lead, and connect current probe to it.)	ON
S102	C-B REC CURRENT	ON : Normal mode OFF : C-Bch record current measuring mode (Measuring point : Short between TP109 and TP110 with shorting lead, and connect current probe to it.)	ON

TBC-17P BOARD SWITCH

No.	NAME	DESCRIPTION	FACTORY SETTING
S1-1	CSDL	Selection of SYNC DELAY/VIDEO DELAY in confi PB mode. ON (CLOSE) : SYNC DELAY mode regardless of SETUP MENU ITEM 701. OFF (OPEN) : According to SETUP MENU ITEM 701.	ON (CLOSE)
S1-2	Y MUTE	ON (CLOSE) : Mutes luminance signal. OFF (OPEN) : Normal mode	OFF (OPEN)
S1-3	C MUTE	ON (CLOSE) : Mutes color difference signal. OFF (OPEN) : Normal mode	OFF (OPEN)
S1-4	VISC BLK	ON (CLOSE) : Mutes VISC signal. OFF (OPEN) : Does not mute VISC signal.	ON (CLOSE)
S1-5	ENR ADJ.	ON (CLOSE) : ENR sensitivity adjustment OFF (OPEN) : Normal mode	OFF (OPEN)
S1-6	COMB	Add COMB filter when color difference signal has H stepped difference which cannot compensate with LCC. ON (CLOSE) : COMB filter ON OFF (OPEN) : COMB filter OFF	OFF (OPEN)
S1-7	LEVEL	This switch uses in adjustment, and switches TBC input signal to internal reference signal regardless of TBC REF switch settings on system control panel. ON (CLOSE) : Internal reference signal. OFF (OPEN) : According to TBC REF switch.	OFF (OPEN)
S1-8	VISC TEST	Uses playback VISC phase adjustment. ON (CLOSE) : Adjustment mode OFF (OPEN) : Normal mode	OFF (OPEN)

DIF-11P BOARD SWITCH

No.	NAME	DESCRIPTION	FACTORY SETTING
S102	INPUT VIDEO V-BLANKING SELECT SWITCH	When VITC switch on system control panel is selected to ON : ON : Blanks the entire V portion. OFF : Blanks n lines for VITC insertion. When VITC switch on system control panel is selected to OFF : S102 is disabled and V-blanking is not performed.	OFF
S801	PARITY CHECK	Factory use only (For reference) This switch uses for parity check of digital serial signal. When this switch is ON, normal video signal dose not output to SERIAL V/A OUTPUT connectors.	OFF

DT-28 BOARD SWITCH SETTING

No.	NAME	DESCRIPTION	FACTORY SETTING
S1	DE-DISTORTION	When this switch is pressed, de-distortion (removal of residual distortion from DT heads) is started.	momentary operation
S2-1	WOBBLING DISABLE	ON : Wobbling OFF OFF : Wobbling ON (Moving DT heads to make RF level maximum.)	OFF
S2-2	DT DISABLE 1	ON : Dynamic tracking OFF (No voltage is supplied to DT heads in all modes except in de-distortion mode.) OFF : Dynamic tracking ON	OFF
S2-3	DT DISABLE 2	ON : Dynamic tracking OFF (DT heads are fixed to neutral position by strain gauge feed back loop.) OFF : Dynamic tracking ON	OFF
S2-4	———	Undefined	OFF
S2-5	Y/C DELAY SERVO DISABLE	ON : Y/C delay servo OFF OFF : Y/C delay servo ON (For reference) Y/C delay servo means that DT heads move to make Y/C delay minimum.	OFF
S2-6	———	Undefined	OFF
S2-7	———	Undefined	OFF
S2-8	———	Undefined	OFF

SS-48DP BOARD SWITCH/SHORT PIN

No.	NAME	DESCRIPTION	FACTORY SETTING
S1	SYSTEM RESET	When this switch is pressed, system is reset.	momentary operation
S2-1	MENU MODE	ON (CLOSE) : System menu OFF (OPEN) : Main menu	OFF (OPEN)
S2-2	———	Factory use	OFF (OPEN)
S2-3	———	Factory use	OFF (OPEN)
S2-4	———	Factory use	OFF (OPEN)
S2-5	———	Factory use	OFF (OPEN)
S2-6	———	Factory use	OFF (OPEN)
S2-7	———	Factory use	OFF (OPEN)
S2-8	———	Factory use	OFF (OPEN)
S201	TAPE DIRECTION	Tape direction output signal on/off ON : Output OFF : Non output	OFF
S301	MENU BANK SELECT	1 : BANK-1	———
		2 : BANK-2	———
		3 : BANK-3	———
S302	ADJ (+)	Maintenance mode (Enter/Advance)	———
S303	ADJ (−)	Maintenance mode (Back step/Exit)	———
S304	ADJ (SET)	Maintenance mode (Data set)	———
S601-1	———	Factory use	OFF (OPEN)
S601-2	———	Factory use	OFF (OPEN)
S601-3	———	Factory use	OFF (OPEN)
S601-4	ERROR INHIBIT	Error detect inhibition on/off ON (CLOSE) : Inhibits error detection OFF (OPEN) : Detects error	OFF (OPEN)
S601-5	———	Factory use	OFF (OPEN)
S601-6	———	Factory use	OFF (OPEN)
S601-7	MODE INHIBIT	Mode change inhibition on/off ON (CLOSE) : Inhibits mode change OFF (OPEN) : Permits mode change	OFF (OPEN)
S601-8	INITIAL DATA SEL.	Initial data selection at just turning on the power ON (CLOSE) : ROM data OFF (OPEN) : NV RAM data	OFF (OPEN)
S602	REEL POSITION	Reel position changing switch when cassette compartment is not installed.	toggle

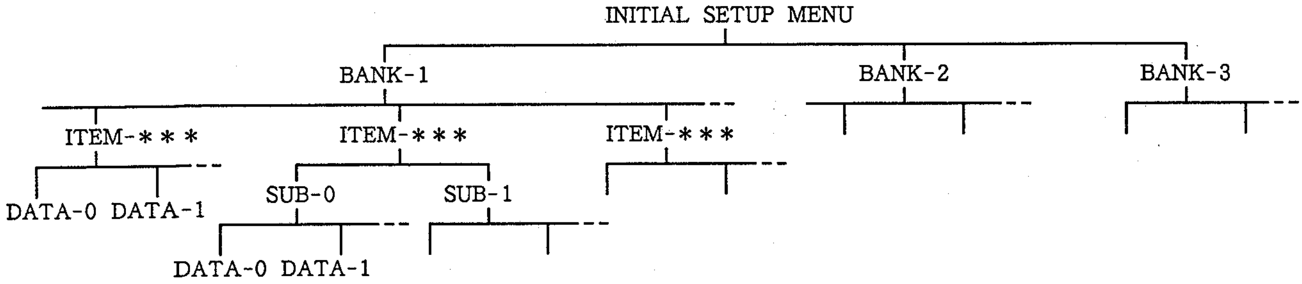
No.	NAME	DESCRIPTION	FACTORY SETTING
COR1	SY SHORT PIN	DT [○ ○] ○ NON DT	(BVW-D75 J MODEL)
		RECORDER [○ ○] ○ PLAYER	
		J [○ ○] ○ U/C	
		NTSC [○ ○] ○ PAL	
		DT [○ ○] ○ NON DT	(BVW-D75 UC MODEL)
		RECORDER [○ ○] ○ PLAYER	
		J ○ [○ ○] U/C	
		NTSC [○ ○] ○ PAL	
		DT [○ ○] ○ NON DT	(BVW-D75PS)
		RECORDER [○ ○] ○ PLAYER	
		J ○ [○ ○] U/C	
		NTSC ○ [○ ○] PAL	

MDM-5P BOARD SWITCH/SHORT PIN

No.	NAME	DESCRIPTION	FACTORY SETTING
S401	Y NL DE-EN DISABLE	ON : Y non linear de-emphasis ON OFF : Y non linear de-emphasis OFF	ON
S801	C NL DE-EN DISABLE	ON : C non linear de-emphasis ON OFF : C non linear de-emphasis OFF	ON
S901	———	Factory use	ALL OFF (OPEN)
S902	———	Factory use	ALL OFF (OPEN)
S1601	Y-RF	NORMAL : Normal mode TEST : For adjustment/test	NORMAL
S1602	C-RF		NORMAL
S1603	Y-FS		NORMAL
S1604	C-FS		NORMAL
COR101	PB Y-RF LPF TEST	COR101 : SHORT COR102 : OPEN } Y Normal COR101 : OPEN COR102 : SHORT } Y Test	Y Normal COR101 : SHORT COR102 : OPEN
COR102			
COR501	PB C-RF LPF TEST	COR501 : SHORT COR502 : OPEN } C Normal COR501 : OPEN COR502 : SHORT } C Test	C Normal COR501 : SHORT COR502 : OPEN
COR502			

1-7. INITIAL SETUP MENU

The memory area of the BVW-D75PS INITIAL SETUP MENU comprises of three banks.
Each bank contains identical ITEMs which can be independently modified.
For this reason, VTR operation switchover is facilitated with the switchover of the banks designated for ON AIR, editing, etc.
Certain ITEMs consist of multiple SUB-ITEMs which contain the DATA. (See the figure below.)



The Switches and Indicators used in modifying the Setup are described below.

(1) Bank Select Switch (SS-48DP board)
The VTR will operate according to the specified bank selected with this switch.
The selected data with this switch is stored at POWER ON or SYSTEM RESET and will start up with the setting of the selected bank. The contents of each bank can be checked with this switch in the Setup modification mode.

(2) MENU Indicators (System control panel)
The Setup Menu Indicator displays the bank settings which the VTR will operate on.
In the Setup modification mode, the MENU indicator of the bank being modified will flash.

(3) MENU Button (System control panel)
Use the MENU button to modify the contents of the Setup.
Press this button to enter the Setup modification mode.
When this button is pressed during the Setup modification mode, the contents modified in this ITEM will be erased, and the unit will exit from the Setup modification mode.

(4) SET Button (System control panel)
Press the SET button to store the modified Setup contents in nonvolatile RAM and exit the Setup modification mode.
The modified settings will be stored in the memory of the flashing memory bank displayed in the MENU indicator.

(5) RESET Button (Lower control panel)
Press the RESET button to reset the entire contents of SETUP to its factory default settings and exit the Setup modification mode.
The flashing memory bank in the MENU indicator represents the bank that will be reset to its factory default settings.

(6) Search Dial (Lower control panel)
Turn the search dial to modify the ITEM, SUB-ITEM and DATA in the Setup modification mode.

(7) STOP button (Lower control panel)
While pressing the STOP button, turn the search dial, then the SUB-ITEM can be modified.

(8) SEARCH button (Lower control panel)
While pressing the SEARCH button, turn the search dial, then the DATA can be modified.

(9) 7-SEG Display (Lower control panel)
The 7-SEG display indicates the ITEM No., SUB-ITEM No. and DATA No. Since the 7-SEG display indicates the minimum data required for modification in the Setup modification mode, modification operation without viewing the monitor TV is possible.

(10) Monitor TV
The ITEM, SUB-ITEM and DATA information are superimposed on the monitor TV screen which is connected to MONITOR OUT connector. The above information will be displayed only when the CHARACTER ON/OFF switch (System control panel) is set to ON.

BVW-D75PS INITIAL SETUP MENU

ITEM-000 SERIES : OPERATION KEY PARAMETER
<001> PREROLL TIME
<002> CHARACTER H-POSITION
<003> CHARACTER V-POSITION
<005> DISPLAY INFORMATION SELECT
<006> LOCAL FUNCTION ENABLE
<007> TAPE TIMER DISPLAY
<008> MONITORING SELECTION FOR VTR-TO-VTR EDIT
<009> CHARACTER TYPE
<010> CHARACTER H-SIZE
<011> CHARACTER V-SIZE
<012> AUDIO MONITOR

ITEM-100 SERIES : OPERATIONAL PARAMETER
<101> SELECTION FOR SEARCH DIAL ENABLE
<102> MAXIMUM TAPE SPEED
<103> AUDIO SELECTED LINE OUT
<104> AUDIO MUTING TIME
<105> REF VIDEO MISSING ALARM
<106> CAPSTAN LOCK
<107> REC INHIBIT LAMP FLASHING
<108> AUTO EE SELECT
<109> FORCED EE WHEN CASSETTE OUT
<111> PROGRAM PLAY
<113> PB HEAD SELECT IN EDIT MODE
<114> AUDIO SELECTED LINEOUT LEVEL
<115> PHASE LOCK IN VARIABLE X3

ITEM-200 SERIES : REMOTE INTERFACE PARAMETER
<201> PARA RUN
<202> CF FLAG REPLAY
<203> STANDBY COMMAND FOR REMOTE-2 I/F
<204> STILL TENSION CMD IN REMOTE-2 I/F

ITEM-300 SERIES : EDITING PARAMETER
<301> VAR SPEED RANGE FOR SYNCHRONIZATION
<302> CAPSTAN RE-LOCKING DIRECTION
<303> EDIT DELAY
<304> EDIT FIELD SELECT
<305> SYNC GRADE
<306> DMC INITIAL SPEED
<307> AUTO-DELETION FOR INCONSISTENT DATA
<309> SERVO REFERENCE SELECT

ITEM-400 SERIES : PREROLL PARAMETER
<401> FUNCTION MODE AFTER CUE-UP
<402> TIME REFERENCE FOR PREROLL
<403> AUTOMATIC PREROLL REFERENCE ENTRY

ITEM-500 SERIES : TAPE PROTECTION PARAMETER
<501> STILL TIMER
<502> TAPE PROTECTION MODE FROM SEARCH
<503> TAPE PROTECTION MODE FROM STOP
<504> DRUM ROTATION IN STANDBY OFF

ITEM-600 SERIES :TIME CODE GENERATOR PARAMETER
<601> VITC POSITION SEL-1
<602> VITC POSITION SEL-2
<603> ID CODE PRESET
<605> TCG REGEN MODE
<606> TC OUTPUT SIGNAL IN REGEN MODE
<607> U-BIT BINARY GROUP FLAG
<608> PHASE CORRECTION
<609> TCG CF FLAG
<610> REGEN AUTO MODE

ITEM-700 SERIES : VIDEO CONTROL PARAMETER
<701> TBC DELAY
<702> WHITE REFERENCE INSERT LINE
<703> BLANK LINE SELECT

ITEM-900 SERIES : FACTORY USE PARAMETER
<901> AUDIO NR IN SP MODE
<902> EMERGENCY TAPE PROTECTION
<913> TRACKING CONTROL VIA SEARCH DIAL

1-7-1. Setup

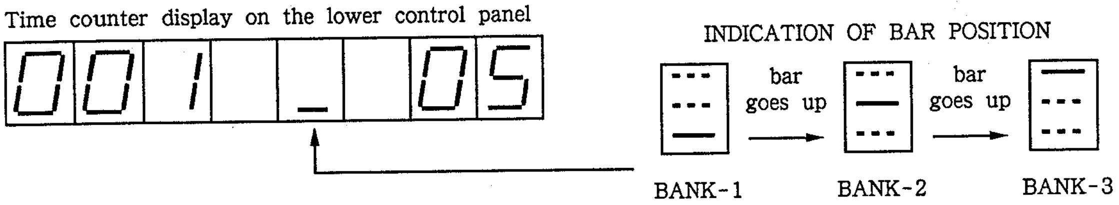
- The system control is set up according to the following procedure.
- The setup appears on the function control panel's time counter display and monitor television.

1. Bank selection

   The Bank selection is performed by setting the Menu Bank Select switch, S301/SS-48DP.

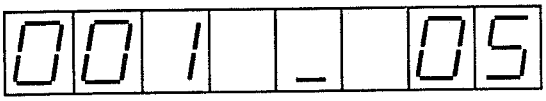
Note : The indication of the bar position differs according to the Bank Select switch (S301/SS-48DP) setting.

Time counter display on the lower control panel

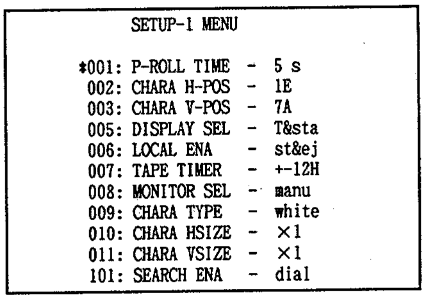


2. How to enter the Setup modification mode
   (1) Turn the POWER switch to ON.
   (2) Press the MENU button on the system control panel, then the SETUP ITEM-001 and PREROLL TIME are displayed.

Time counter display on the lower control panel



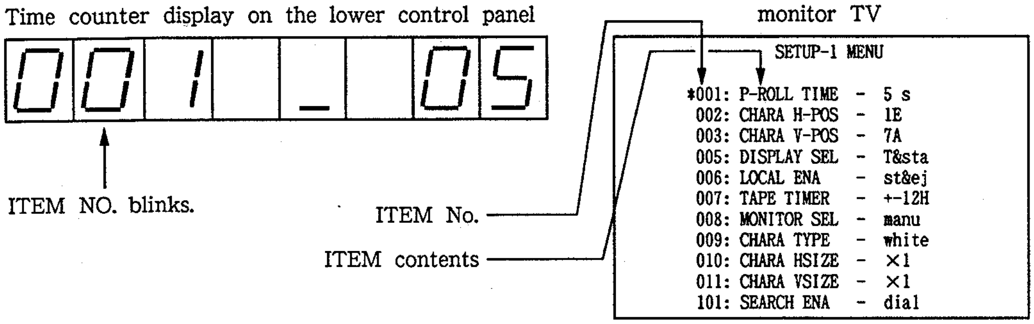
monitor TV



```
        SETUP-1 MENU

*001: P-ROLL TIME  -  5 s
 002: CHARA H-POS  -  1E
 003: CHARA V-POS  -  7A
 005: DISPLAY SEL  -  T&sta
 006: LOCAL ENA    -  st&ej
 007: TAPE TIMER   -  +-12H
 008: MONITOR SEL  -  manu
 009: CHARA TYPE   -  white
 010: CHARA HSIZE  -  ×1
 011: CHARA VSIZE  -  ×1
 101: SEARCH ENA   -  dial
```

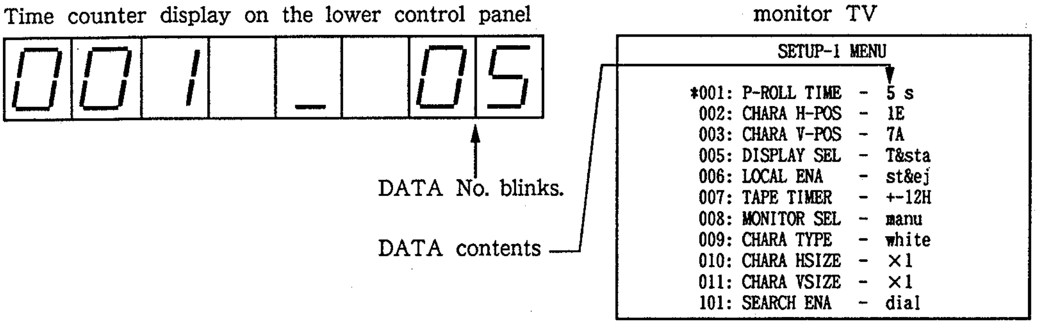
3. How to select the ITEM
   (1) Push the search dial to enter JOG mode. Turn the search dial and select the SETUP ITEM to be set (the time counter display ITEM No. blinks). Turn the search dial clockwise to increase the ITEM No. and counterclockwise to decrease it.

4. How to select the SUB-ITEM
   (1) Turn the search dial and select the SETUP ITEM which contain the SUB-ITEM menu.
   (2) Turn the search dial while pressing the STOP button. Then the SUB-ITEM menu display can be obtained.


Time counter display on the lower control panel
001 _ 05
ITEM NO. blinks.
ITEM No.
ITEM contents
monitor TV

```
SETUP-1 MENU

*001: P-ROLL TIME  -  5 s
 002: CHARA H-POS  -  1E
 003: CHARA V-POS  -  7A
 005: DISPLAY SEL  -  T&sta
 006: LOCAL ENA    -  st&ej
 007: TAPE TIMER   -  +-12H
 008: MONITOR SEL  -  manu
 009: CHARA TYPE   -  white
 010: CHARA HSIZE  -  ×1
 011: CHARA VSIZE  -  ×1
 101: SEARCH ENA   -  dial
```

5. How to set the DATA
   (1) Turn the search dial while pressing the SEARCH button, and set the DATA (the time counter display Data No. blinks). Turn the search dial clockwise to increase the data number and counterclockwise to decrease it.


Time counter display on the lower control panel
001 _ 05
DATA No. blinks.
DATA contents
monitor TV

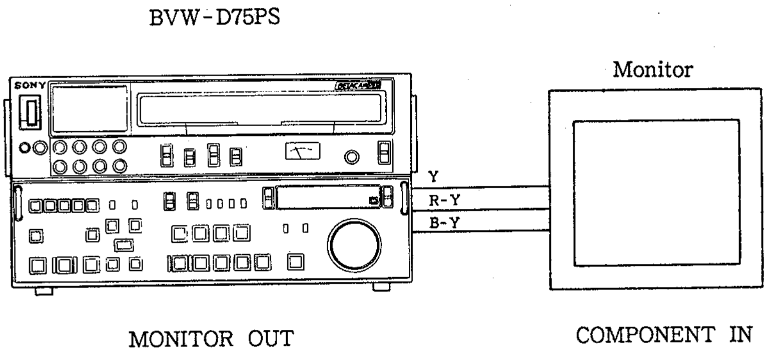
```
SETUP-1 MENU

*001: P-ROLL TIME  -  5 s
 002: CHARA H-POS  -  1E
 003: CHARA V-POS  -  7A
 005: DISPLAY SEL  -  T&sta
 006: LOCAL ENA    -  st&ej
 007: TAPE TIMER   -  +-12H
 008: MONITOR SEL  -  manu
 009: CHARA TYPE   -  white
 010: CHARA HSIZE  -  ×1
 011: CHARA VSIZE  -  ×1
 101: SEARCH ENA   -  dial
```

6. To modify other SETUP ITEMS, repeat Steps 3 through 5.

7. Press the SET button on the system control panel after the DATA has been set.
   Setup data is then stored into a nonvolatile memory (NVRAM). After that, the setting data remains unchanged even if the POWER switch is turned OFF.

8. To turn all data to the factory settings, press the time counter display RESET button after pressing the MENU button.

Connection


BVW-D75PS
SONY
Monitor
Y
R-Y
B-Y
MONITOR OUT
COMPONENT IN

1-7-2. Main Menu

The numbers enclosed in boxes in the DATA column indicate the factory settings.

ITEM-000 SERIES : OPERATIONAL KEY PARAMETER

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
001	PREROLL TIME	00 01 02 03 04 $\boxed{05}$ 06 07 08 09 10 11 12 13 14 15	0 sec 1 sec 2 sec 3 sec 4 sec $\boxed{5\ \text{sec}}$ 6 sec 7 sec 8 sec 9 sec 10 sec 11 sec 12 sec 13 sec 14 sec 15 sec	Set the preroll time to between 0 and 15 seconds in steps of 1 second. A preroll time of 5 seconds and more is recommended when using this unit for editing.
002	CHARACTER H-POSITION	00 | $\boxed{1E}$ | 57		Adjust the horizontal position of the characters superimposed on the signal output from the MONITOR OUTPUT connector. The hexadecimal value "00" is for the far left of the screen and "57" (decimal 87) for the far right. Increasing the value moves the position of the characters to the right.
003	CHARACTER V-POSITION	00 | $\boxed{7A}$ | 94		Adjust the vertical position of the characters superimposed on the signal output from the MONITOR OUTPUT connector. The hexadecimal value "00" is for the top of the screen and "94" (decimal 148) for the bottom. Increasing the value lowers the position of the screen.
005	DISPLAY INFORMATION SELECT	$\boxed{0}$ 1 2 3 4 5	$\boxed{\text{time data \& status}}$ time data & UB time data & CTL time data & time data time data & only replay indicate	When the CHARACTER ON/OFF switch is turned on, select the data output from the MONITOR OUTPUT connector. DATA No. 0 : Timer information and VTR status. DATA No. 1 : Timer information and user bits. DATA No. 2 : Timer information and CTL. DATA No. 3 : Timer information (LTC and VITC). DATA No. 4 : Timer information only (LTC or VITC). DATA No. 5 : "R" (Replay) indication for a variable speed playback using DT head.
006	LOCAL FUNCTION ENABLE	0 $\boxed{1}$ 2	all disable $\boxed{\text{stop \& eject}}$ all enable	When the REMOTE/LOCAL select switch is set to the REMOTE mode, select the switch and buttons on the control panel to enable. DATA No. 0 : All of the switches/buttons are disabled. DATA No. 1 : Only the STOP and EJECT buttons are enabled. DATA No. 2 : All switches/buttons except RECORDER and PLAYER buttons are enabled.

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
007	TAPE TIMER DISPLAY	$\boxed{0}$ 1	$\boxed{+/-\ 12H}$ 24H	Determines whether the CTL counter should display 12-hour or 24-hour time. DATA No. 0 : 12-hour time. DATA No. 1 : 24-hour time.
008	MONITORING SELECTION FOR VTR-TO-VTR EDIT	$\boxed{0}$ 1	$\boxed{\text{recorder only}}$ auto switch	When only one monitor TV is connected to the recorder during tape editing with two VTRs, determines whether the recorder is forced into EE mode when the recorder's PLAYER button is pressed to view the player's playback signals on the monitor. DATA No. 0 : Do not force the recorder into EE mode. DATA No. 1 : Force the recorder into EE mode. Playback signal of the player output.
009	CHARACTER TYPE	$\boxed{0}$ 1 2 3		Determines the type of superimposed characters output from the MONITOR OUTPUT connector. DATA No. 0 : White characters on a black background. DATA No. 1 : Black characters on a white background. DATA No. 2 : White characters with black outline. DATA No. 3 : Black characters with white outline.
010	CHARACTER H SIZE	$\boxed{01}$ 02		Determines the horizontal size of superimposed characters output from the MONITOR OUTPUT connector. DATA No. 01 : Standard DATA No. 02 : Twice the standard size
011	CHARACTER V SIZE	$\boxed{01}$ 02 03 04		Determines the vertical size of superimposed characters output from the MONITOR OUTPUT connector. DATA No. 01 : Standard size DATA No. 02 : Twice the standard size DATA No. 03 : 3 times the standard size DATA No. 04 : 4 times the standard size
012	AUDIO MONITOR	$\boxed{0}$ 1	$\boxed{\text{stereo}}$ mono	Determines the "stereo/mono" signal from the AUDIO SELECTED OUTPUT connector. DATA No. 0 : stereo DATA No. 1 : mono Note : Regardless of this SETUP, the HEADPHONES output is always stereo. This SETUP operates only when the SYSTEM MENU 103 is set to manual or auto LNG select.

1-7-3. System Menu

When entering the system Menu, set S2-Bit1 (P-1) on SS-48DP board to ON (CLOSE) state.
The numbers enclosed in boxes in the DATA column indicate the factory settings.

ITEM-100 SERIES : OPERATIONAL PARAMETER

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
101	SELECTION FOR SEARCH DIAL ENABLE	$\boxed{0}$ 1	$\boxed{\text{dial direct}}$ via search key	Determines when the unit is put into search mode. DATA No. 0 : Whenever the search dial is rotated, the unit is put into search mode except during recording and editing. DATA No. 1 : Whenever the SEARCH button is pressed.
102	MAXIMUM TAPE SPEED	$\boxed{0}$ 1 2	$\boxed{\text{X42}}$ X42 (shuttle X24) X24	Sets the maximum tape speed for fast forward and rewind, and the maximum tape speed selectable with the search dial. DATA No. 0 : 42 times normal speed. DATA No. 1 : 42 times normal speed for fast forward and rewind, and 24 times normal speed for the shuttle mode. DATA No. 2 : 24 times normal speed.
103	AUDIO SELECTED LINE OUT	$\boxed{0}$ 1 2	$\boxed{\text{manual}}$ auto AFM/LNG select auto LNG select	Selects the signal output to AUDIO SELECTED OUTPUT connector. DATA No. 0 : The selected signal is output using the AUDIO MONITOR switch on upper control panel. DATA No. 1 : An AFM (CH-3/CH-4) signal is output in stereo in the metal particle tape PB mode, and an LNG (CH-1/CH-2) signal in the oxide tape PB mode. DATA No. 2 : The selected signal is output using the AUDIO MONITOR switch on upper control panel. However, when the AFM signal is selected in the variable-speed play mode, the LNG signal is output automatically. **Note:** When this ITEM is set to auto, the level of the signal output from the AUDIO SELECTED OUTPUT connectors cannot be adjusted by any volume.
104	AUDIO MUTING TIME	$\boxed{00}$ 01 02 03 04 05 06 07 08 09 10	$\boxed{\text{off}}$ 0.1 sec 0.2 sec 0.3 sec 0.4 sec 0.5 sec 0.6 sec 0.7 sec 0.8 sec 0.9 sec 1.0 sec	Determines the length of time during which audio signals are muted when changing from STOP or STILL mode to playback mode. Can be set to any value between 0 and 1.0 second in steps of 0.1 second.
105	REF VIDEO MISSING ALARM	$\boxed{0}$ 1	$\boxed{\text{off}}$ on	Issue warning if reference video signals are not being supplied through the REF VIDEO INPUT connectors. DATA No. 0 : Do not issue warning. DATA No. 1 : Warn by flashing the STOP button.

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
106	CAPSTAN LOCK	$\boxed{0}$ 1 2 3 4	$\boxed{\text{switch select}}$ 2F 2F/4F 4F 8F	Select the capstan servo lock mode. DATA No. 0 : Use the setting of the CAPSTAN LOCK switch on the subcontrol panel. DATA No. 1 : Always 2F, regardless of CAPSTAN LOCK switch on the subcontrol panel. DATA No. 2 : Always 2F/4F, regardless of CAPSTAN LOCK switch on a subcontrol panel. DATA No. 3 : Always 4F, regardless of CAPSTAN LOCK switch on the subcontrol panel. DATA No. 4 : Always 8F, regardless of CAPSTAN LOCK switch on the subcontrol panel.
107	REC INHIBIT LAMP FLASHING	$\boxed{0}$ 1	$\boxed{\text{off}}$ on	Selects whether the REC INHIBIT lamp flashes or not, when the REC INHIBIT switch on the subcontrol panel is set to OFF and the Miss-REC plug on a cassette tape is lowered. DATA No. 0 : The lamp does not flash. DATA No. 1 : The lamp flashes.
108	AUTO EE SELECT	$\boxed{0}$ 1	$\boxed{\text{stop/f. fwd/rew}}$ stop	Determines when the unit is automatically put into EE mode, for both audio and video signals. If the Monitor mode selector on the control panel is set to PB/EE, this setting is ignored. DATA No. 0 : EE in Stop/Eject/Fast Forward/Rewind modes. DATA No. 1 : EE in Stop/Eject modes.
109	FORCED EE WHEN TAPE UNTHREAD	$\boxed{0}$ 1	$\boxed{\text{on}}$ off	Selects whether the PB/EE mode is controlled using a Monitor mode selector on the control panel during threading/unthreading and cassette out. DATA No. 0 : The PB/EE mode cannot be controlled. (always EE mode signal) DATA No. 1 : The PB/EE mode can be controlled.
111	PROGRAM PLAY	$\boxed{0}$ 1	$\boxed{\text{disable}}$ enable	Selects whether the program play mode is disable or not. DATA No. 0 : Program play mode is disable. DATA No. 1 : Program play mode is enable

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
113	PB HEAD SELECT- IN EDIT MODE	0 1	disable enable	Selects the DT head PB mode in EDIT mode (in ASSEMBLE or INSERT). DATA No. 0 : Selects the R/P head PB mode even if the DT SELECT switch on the control panel is set in any position. DATA No. 1 : When the DT SELECT switch on the control panel is set to the OFF position, selects the R/P head PB mode. When the DT SELECT switch is set SRC or VAR, selects the DT head PB mode. However, in the PLAY or auto edit mode (PREVIEW, AUTO EDIT, REVIEW), selects the R/P head PB mode even if the DT SELECT switch is set in any position. **Note:** When DATA No. 1 (enable) is selected, set the TBC DELAY switch on the player VTR to "video delay". BVW-75P : S4-8 switch off (TBC-9P board) BVW-D75PS : SYSTEM MENU ITEM 701 "video delay"
114	AUDIO SELECTED LINEOUT LEVEL	0 1	variable fixed	Selects the audio level from AUDIO SELECTED OUTPUT connectors. DATA No. 0 : The audio level can be adjusted with the HEADPHONES level control knob. DATA No. 1 : The audio level is fixed to a certain level.
115	PHASE LOCK IN VARIABLE X3	0 1	off on	Selects whether the capstan phase is locked or unlocked in 3 times speed variable mode. DATA No. 0 : Cannot be locked the capstan phase in 3 times speed variable mode. DATA No. 1 : Can be locked the capstan phase in 3 times speed variable mode.

ITEM-200 SERIES : REMOTE INTERFACE PARAMETER

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
201	PARA RUN	$\boxed{0}$ 1	$\boxed{\text{disable}}$ enable	Selects whether two (or more) VTRs should be operated in parallel operation. DATA No. 0 : No parallel operation DATA No. 1 : When the RECORDER and PLAYER buttons on the function control panel are pressed, the two lamps light. Operation can then be parallel. **Note:** To operate VTRs in parallel operation, set ITEM 201 of all VTRs to DATA No. 1.
202	CF FLAG REPLAY	$\boxed{0}$ 1	$\boxed{\text{8F}}$ 4F or 8F	Selects to which mode the COLOR FRAME LOCK status fed to the remote controller is set. DATA No. 0 : 8F (COLOR FRAME LOCK status is locked at 8 fields.) DATA No. 1 : 4F or 8F (COLOR FRAME LOCK status is locked at 4 fields or 8 fields.)
203	STANDBY COMMAND FOR REMOTE-2 I/F	$\boxed{0}$ 1	$\boxed{\text{stop \& pause}}$ stop or pause	Selects the STANDBY ON/OFF mode using the remote control unit which is connected to the REMOTE-2 (36P) connector. DATA No. 0 : When the STOP and PAUSE buttons are pressed simultaneously, the STANDBY mode is turned on or off. DATA No. 1 : When the STOP button is pressed, the STANDBY ON mode is entered. When the PAUSE button is pressed in the STOP mode, the STANDBY mode is turned on or off.
204	STILL TENSION CMD IN REMOTE-2 I/F	$\boxed{0}$ 1	$\boxed{\text{disable}}$ enable	When a STILL TENSION COMMAND is output from the remote control unit connected to the REMOTE-2 (36P) connector, selects whether the VTR accepts the command. DATA No. 0 : No command is accepted. DATA No. 1 : A command is accepted. **Note:** Select DATA No. 0 when connected to BVE-3000 and DATA No. 1 when connected to BVR-510ACE.

ITEM-300 SERIES : EDITING PARAMETER

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
301	VAR SPEED RANGE FOR SYNCHRONI-ZATION	$\boxed{0}$ 1	$\boxed{-1 \sim +3}$ $-1.15 \sim +3.45$	Sets the speed range when the variable speed is controlled using the remote control unit connected to the REMOTE-1 connector (9P). DATA No. 0 : $-1 \sim +3$ DATA No. 1 : $-1.15 \sim +3.45$ **Note:** Select DATA No. 1 when connected to the BVE-910 editing controller for DT editing. When DATA No. 1 is selected or the DT playback is done at -1 to $+3$ times normal speed or more, the picture may be missed at the bottom of the screen (this is not a defect).
302	CAPSTAN RE-LOCKING DIRECTION	0 $\boxed{1}$	deceleration $\boxed{\text{acceleration}}$	When the CAPSTAN LOCK switch on the subcontrol panel is set to 4F, selects whether the capstan servo is locked in the acceleration or deceleration mode. DATA No. 0 : Locked in the deceleration mode. DATA No. 1 : Locked in the acceleration mode. **Note:** Select DATA No. 1 when connected to BVU-800P series, BVW-D75PS, BVW-75P, BVW-40P and BVW-10P for editing and DATA No. 0 when connected to a 1-inch VTR and Digital VTR for editing.
303	EDIT DELAY	$\boxed{0}$ 1	$\boxed{\text{6-field}}$ 4-field	After receiving a recording command from the remote control unit during tape editing, selects the number of fields until the VTR put into the recording mode. DATA No. 0 : Put into the recording mode at six fields later after the command is received. DATA No. 1 : Put into the recording mode at four fields later after the command is received. **Note:** Set DATA No. 1 when connected to BVE-500ACE.
304	EDIT FIELD SELECT	$\boxed{0}$ 1	$\boxed{\text{1F}}$ 2F	Selects the start timing during tape editing. DATA No. 0 : Editing starts at field 1 and ends at field 2. DATA No. 1 : Editing starts at field 2 and ends at field 1.
305	SYNC GRADE	$\boxed{0}$ 1	$\boxed{\text{accurate}}$ rough	Selects the editing accuracy when SYNCHRONIZE switch (system control panel) is set to ON and editing is done in the synchronize mode. DATA No. 0 : Editing is done with editing accuracy ±0 frame. DATA No. 1 : Editing is done with editing accuracy ±1 frame.

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
306	DMC INITIAL SPEED	$\boxed{00}$ 01 02 03 04 05 06 07 08 09 10 11 12 13	$\boxed{\text{manual}}$ play still +0.03 +0.1 +0.2 +0.5 +1 +2 −0.03 −0.1 −0.2 −0.5 −1	Selects the initial speed which is set automatically when DMC (Dynamic Motion Control) editing is performed. DATA No. 00 : Sets the initial speed by the rotation angle of the search dial. DATA No. 01 : The initial speed in the PLAY mode. DATA No. 02 : The tape stops (STILL mode). DATA No. 03 to 13 : The initial speed is a speed in the search mode.
307	AUTO-DELETION FOR INCONSISTENT DATA	$\boxed{0}$ 1 2	$\boxed{\text{manual}}$ neg & excess neg	Selects the operation when an erroneous edit point is set. DATA No. 0 : The DELETE button blinks. Delete the undesired edit point or set the edit point correctly. DATA No. 1 : When the edit point is set as IN ≧ OUT or AUDIO IN ≧ AUDIO OUT or the number of edit points is excessive, the previously entered edit point is deleted automatically. DATA No. 2 : When the edit point is set as IN ≧ OUT or AUDIO IN ≧ AUDIO OUT, the previously entered edit point is deleted automatically. When the number of edit points is excessive, the DELETE button blinks. **Note:** • When the edit point's button and the DELETE button are pressed simultaneously, data at the edit point is deleted. • When an erroneous edit point is set (the DELETE button blinks), editing (PREVIEW or AUTO EDIT) is not executed.
309	SERVO REFERENCE SELECT	$\boxed{0}$ 1	$\boxed{\text{auto}}$ external	Select the reference signal for servo. DATA No. 0 : For recording, use input signal from the REF VIDEO INPUT connector as a reference signal. For playback, the servo operates by external reference signal from REF VIDEO INPUT connector. If there is not input from REF VIDEO INPUT connector, the servo operates by internal reference signal. DATA No. 1 : Always use input signal from REF VIDEO INPUT connector as a reference signal.

ITEM-400 SERIES : PREROLL PARAMETER

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
401	FUNCTION MODE AFTER CUE-UP	$\boxed{0}$ 1	$\boxed{\text{stop}}$ still	Selects the mode after cue-up is completed. DATA No. 0 : Stop mode. DATA No. 1 : Still mode. (Search mode.)
402	TIME REFERENCE FOR PREROLL	$\boxed{0}$ 1	$\boxed{\text{CTL}}$ TC	When a tape with the time code signal containing a discontinuous point is used and the discontinuous point is prerolled, selects whether the time code signal preceding the point is interpolated and prerolled using a CTL signal. DATA No. 0 : Interpolates with a CTL signal. DATA No. 1 : Does not interpolate with a CTL signal. **Note:** When "0" is selected, maximum tape speed during cue-up or preroll is limited to 10 times normal speed.
403	AUTOMATIC PREROLL REFERENCE ENTRY	$\boxed{0}$ 1	$\boxed{\text{disable}}$ enable	When the PREROLL start point or PREROLL IN point is not entered, selects whether the IN point is entered by pressing only the PREROLL buttton. DATA No. 0 : IN point is not enterd automatically. DATA No. 1 : IN point is enterd automatically.

ITEM-500 SERIES : TAPE PROTECTION PARAMETER

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
501	STILL TIMER	00	0.5 sec	The unit automatically enters the tape PROTECTION mode after it has been in the tape STOP (or STILL) mode for a designated time to prevent from video head clogging and tape damage. This item sets the transition time from the tape STOP to tape PROTECTION mode. The time can be set from 0.5 second to 30 minutes.
		01	5 sec	
		02	10 sec	
		03	20 sec	
		04	30 sec	
		05	40 sec	
		06	50 sec	
		07	1 min	
		08	2 min	
		09	3 min	
		10	4 min	
		11	5 min	
		12	6 min	
		13	7 min	
		$\boxed{14}$	$\boxed{\text{8 min}}$	
		15	30 min	
502	TAPE PROTECTION MODE FROM SEARCH	$\boxed{0}$	$\boxed{\text{step fwd}}$	When the time in the STILL mode set using ITEM 501 passes, the unit enters the tape PROTECTION mode. This item selects the tape PROTECTION mode setting. DATA No. 0 : When the time designated by ITEM 501 passes, the tape is sent repeatedly for 2 seconds at 1/30 times normal speed in the forward direction. DATA No. 1 : When the designated time passes, the unit enters the STANDBY OFF mode. DATA No. 2 : When the designated time passes, the unit enters the TENSION RELEASE mode.
		1	standby off	
		2	tension release	
503	TAPE PROTECTION MODE FROM STOP	$\boxed{0}$	$\boxed{\text{standby off}}$	When the time in the STOP mode set using ITEM 501 passes, the unit enters the tape PROTECTION mode. This item selects the tape PROTECTION mode setting. DATA No. 0 : When the designated time passes, the unit enters the STANDBY OFF mode. DATA No. 1 : When the designated time passes, the unit enters the TENSION RELEASE mode.
		1	tension release	
504	DRUM ROTATION IN STANDBY OFF	$\boxed{0}$	$\boxed{\text{off}}$	Selects whether the head drum rotation stops in STANDBY OFF mode. DATA No. 0 : Drum rotation stops. DATA No. 1 : Drum rotates.
		1	on	

ITEM-600 SERIES : TIME CODE GENERATOR PARAMETER

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
601	VITC POSITION SEL-1	9	9/322 lines	Selects into what line the VITC signal is inserted. The VITC signal can be inserted in lines 9/322 through 22/335.
		10	10/323 lines	
		11	11/324 lines	
		12	12/325 lines	
		13	13/326 lines	
		14	14/327 lines	
		15	15/328 lines	
		16	16/329 lines	
		17	17/330 lines	
		18	18/331 lines	
		$\boxed{19}$	$\boxed{\text{19/332 lines}}$	
		20	20/333 lines	
		21	21/334 lines	
		22	22/335 lines	
602	VITC POSITION SEL-2	9	9/322 lines	Selects into what line the VITC signal is inserted. The VITC signal can be inserted in lines 9/322 through 22/335. **Note:** The VITC signal can be inserted into two positions by ITEMs 601 and 602.
		10	10/323 lines	
		11	11/324 lines	
		12	12/325 lines	
		13	13/326 lines	
		14	14/327 lines	
		15	15/328 lines	
		16	16/329 lines	
		17	17/330 lines	
		18	18/331 lines	
		$\boxed{19}$	$\boxed{\text{19/332 lines}}$	
		20	20/333 lines	
		21	21/334 lines	
		22	22/335 lines	
603	ID CODE PRESET	$\boxed{0}$	$\boxed{\text{disable}}$	When the ID code is set, selects DATA No.1 (ENABLE). DATA No. 0 : The ID code is not set. DATA No. 1 : The ID code set mode is entered. **Note:** To set the ID code, select the DATA No.1 (ENABLE) in ITEM 603 and light up the HOLD lamp on the control panel. By blinking time counter display urge ID code to set. Take a figure up or down number positions using SHIFT button and select the figure using ADVANCE button. Press the PRESET button after the ID code to set. This item is automatically disabled after setting ID code.
		1	enable	
605	TCG REGEN MODE	$\boxed{0}$	$\boxed{\text{TC \& UB}}$	Specify the signals to be regenerated when the time code generator is in regenerate mode with the REGEN/PRESET switch on a system control panel set to REGEN, or during automatic editing. DATA No. 0 : Both time code and user bit signals are regenerated. DATA No. 1 : Only a time code signal is regenerated. DATA No. 2 : Only a user bits signal is regenerated.
		1	TC	
		2	UB	

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
606	TC OUTPUT SIGNAL IN REGEN MODE	0 1	off tape regen	Selects the signal output from the TIME CODE OUT connector when the internal time code generator regenerates with the playback time code signal (when the EXT/INT switch set to INT on a subcontrol panel and the REGEN/PRESET switch on a system control panel set to REGEN, or during automatic editing). DATA No. 0 : The playback time code signal is not regenerated and output. DATA No. 1 : The playback time code signal is regenerated and output only when the servo is locked in the PLAY mode.
607	U-BIT BINARY GROUP FLAG	00 01 10 11	not specified iso character unassigned-1 unassigned-2	Sets the user bits status of the time code signal which is generated using a time code generator. DATA No. 00 : Character setting is not specified. DATA No. 01 : 8-bit characters setting based on ISO 646 and ISO 2022. DATA No. 10 : Unassigned. DATA No. 11 : Unassigned.
608	PHASE CORRECTION	0 1	off on	Selects whether the phase correction of the LTC signal which is generated using a time code generator should be performed or not. DATA No. 0 : The phase correction does not perform. DATA No. 1 : The phase correction performs.
609	TCG CF FLAG	0 1 2	off on auto	Selects whether the CF flag at blank bit of time code data should be turned on or off. DATA No. 0 : The CF flag is turned off. DATA No. 1 : The CF flag is turned on. DATA No. 2 : The CF flag is turned on or off according to the relation between the recorded video signal and the time code's color framing pulse. **Note:** In the auto mode, the CF flag is controlled as described below according to the time code generator mode. INT PRESET mode : The time code is generated when a CF flag is locked to the video signal. The CF flag is then turned on. INT REGEN mode : When the CAPSTAN LOCK switch on the subcontrol panel is set to 8FD, the CF flag is turned on. For setting other than the above, the CF flag is turned off. In EXT mode : The CF flag is turned off.

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
610	REGEN AUTO MODE	0 1 2	assem & insert assem manual	Selects whether a time code is regenerated automatically in the VTR to VTR editing mode. DATA No. 0 : When this set is used as a recorder in the VTR to VTR editing mode, the TCG regenerates according to the time code on tape during ASSEMBLE and INSERT editing, irrespective of REGEN/PRESET switch setting on the system control panel. DATA No. 1 : When this set is used as a recorder in the VTR to VTR editing mode, the TCG regenerates according to the time code on tape during ASSEMBLE editing, irrespective of REGEN/PRESET switch setting. DATA No. 2 : The time code generator is activated according to EXT/INT switch on the subcontrol panel and REGEN/PRESET switch on the system control panel irrespective of the BVW-D75PS's mode setting.

ITEM-700 SERIES : VIDEO CONTROL PARAMETER

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
701	TBC DELAY	$\boxed{0}$ 1	$\boxed{\text{sync delay}}$ video delay	In EE mode, video output signals are delayed with respect to input signals by the amount of time needed for TBC processing. This ITEM selects whether the sync signal should be added to the delayed video output signal or whether they should be added to the input signal as the same timing of input video signal ingnoring signal delay. DATA No. 0 : The sync signal is output as the same timing with video signal. DATA No. 1 : The sync signal is output without delay, but video signals are output with delay.
702	WHITE REFERENCE INSERT LINE	Y/C $\boxed{0}$ 1 2 3 4 5 6 7 8 9 A B C D	*1 $\boxed{\text{9H}}$ 10H 11H 12H (Y only) 13H 14H 15H 16H 17H 18H 19H 20H 21H 22H	When the LEVEL REF switch on the system control panel is set to TBC or RF OSC, selects the inserted reference marker line in the video signal. Period is lines 9/322 through 22/335. The C 12/325 line cannot be inserted.
703	BLANK LINE SELECT	Lines 9/322 through 22/325 $\boxed{0}$ 1 Lines 23/336 $\boxed{1}$ 2	*2 $\boxed{\text{blank}}$ throu $\boxed{\text{half}}$ throu	Selects the blanking lines in V-blanking period of the output video signal. Each of the lines may be set ON or OFF separately. DATA No. 0 : Blanking ON DATA No. 1 : A Half Blanking ON DATA No. 2 : Blanking OFF

Note:

*1 : To choose Y signal or C signal, rotate the search dial while pressing the STOP button so that * mark on the monitor screen moves to "Y" or "C".

*2 : To choose lines, rotate the search dial while pressing the STOP button.

ITEM-900 SERIES : FACTORY USE PARAMETER (ADJUSTMENT USE ONLY)

The items below are not displayed during normal operation to avoid the erroneous operation.
In order to display "Items 901, 902 and 913", turn the search dial while pressing the PLAY button in setup modification mode.
These three items are used exclusively for adjustment. After adjustment is completed, the menu data should be returned to the factory setting.

ITEM		DATA		Item and Data Description
No.	ITEM	No.	DATA	
901	AUDIO NR IN SP MODE	$\boxed{0}$ 1	$\boxed{\text{on}}$ switch select	This setting is used exclusively for audio adjustment. After adjustment is completed, be sure to return this item to the factory setting position. The Dolby NR control is selected when a metal particle tape is used for recording and playback. DATA No. 0 : Turned on at all times when the metal particle tape is used. DATA No. 1 : Turned on or off using a Dolby NR switch on the subcontrol panel. **Note:** When an oxide tape is used, set using an Dolby NR switch on the subcontrol panel irrespective of this setting.
902	EMERGENCY TAPE PROTECTION	$\boxed{0}$ 1	$\boxed{\text{enable}}$ disable	This setting is used exclusively for servo and mechanical adjustments. After adjustment is completed, be sure to return this item to the factory setting position. When the VTR detects an error in the tape transport system, selects whether tape protection is done or not. DATA No. 0 : Tape protection is done. DATA No. 1 : Tape protection is not done. **Note:** When the data No. is 1, AUTO OFF lamp lights.
913	TRACKING CONTROL VIA SEARCH DIAL	$\boxed{0}$ 1	$\boxed{\text{off}}$ on	This item is used only for DT and video tracking adjustments. After adjusting, set back to the 0 (off) factory setting. Tracking control during DT head playback is possible. DATA No. 0 : Tracking control during DT head playback is not possible. DATA No. 1 : Tracking control during DT head playback is possible by turning the search dial (SHUTTLE mode).

1-8. RACK MOUNTING

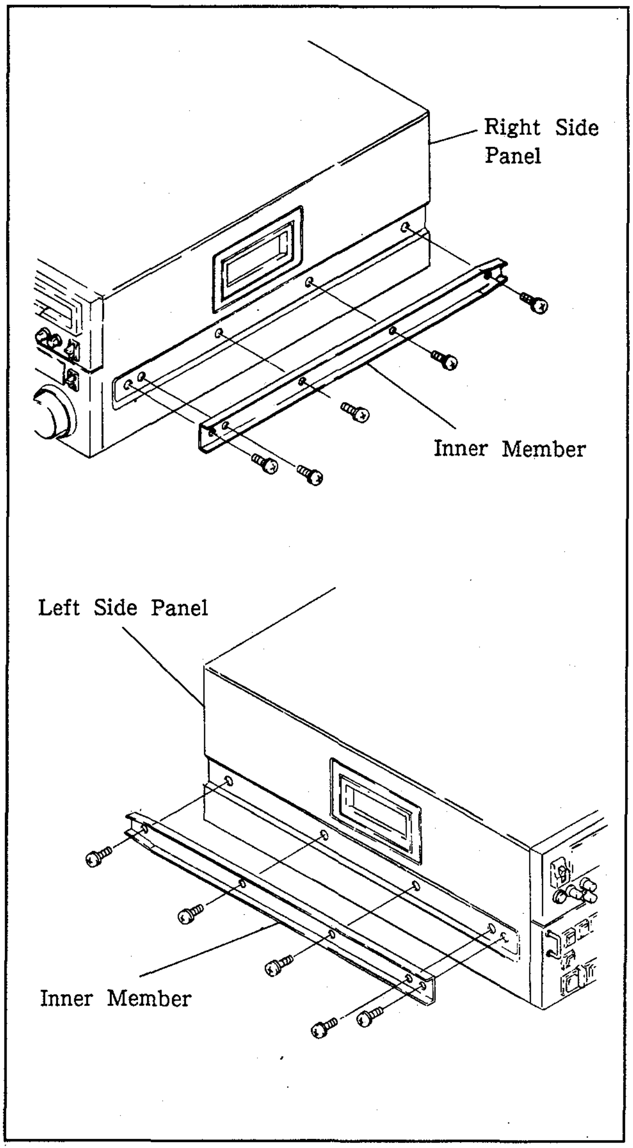
The unit can be mounted in the 19-inch standard rack. It is recommended to use the the following kit.

Rack Mount Kit : RMM-100 (optional accessory) or the RACK-MOUNT SLIDES : MODEL 305 slide length 22 inches (producted by ACCURIDE Gorp.).

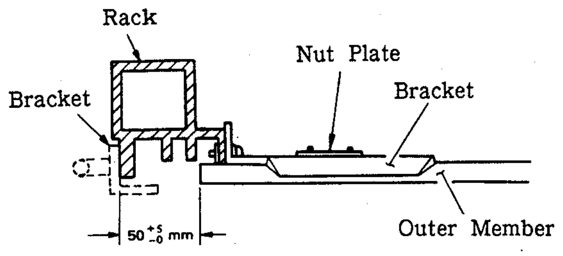
Notes on rack mounting

- When several units are mounted in a rack, it is recommended to install a fan for ventilation. Good air circulation is essential to prevent internal heat build-up in a rack (5℃ to 40℃ must be met for all units).
- Never remove upper panel and lower panel during rack mounting.
- Be sure to secure the rack to the floor to avoid accidents when the unit is pulled out.

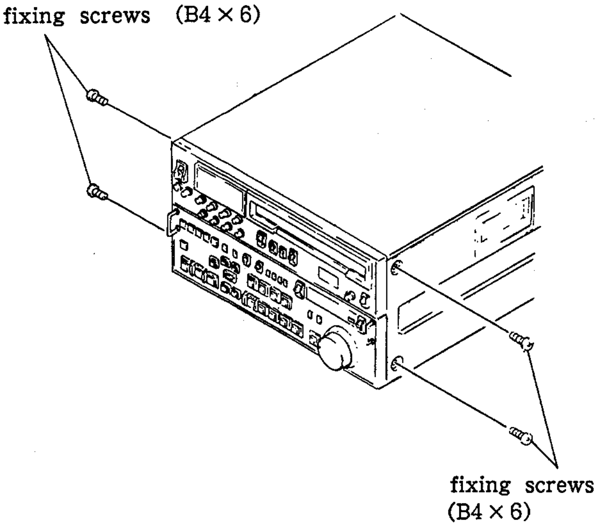
1. Remove the five screws on right and left side panels.
2. Install the Inner Members of the slide rails to the right and left side panels with the screws removed in Step (1).



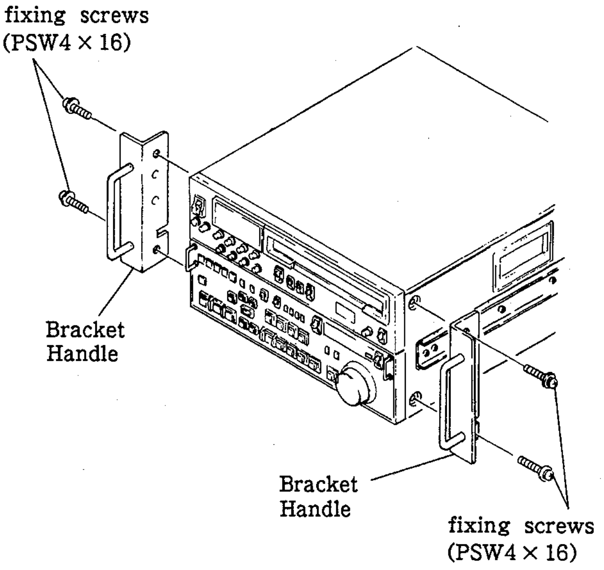
3. Remove the four feet on the lower panel.
   If the unit is mounted in the rack with the feet attached, they will contact the lower and the upper portions of the rack and the unit cannot be pulled out from the rack.
4. Install the Outer Member bracket of the slide rail to the rack. Adjust the distance from the edge of the slide rail to the outside of the rack so that it meets the required specification.


Rack
Nut Plate
Bracket
Bracket
50^{+5}_{-0} mm
Outer Member

5. Remove the two screws on the right and left side panels. (Be careful not to lose these four screws.)


fixing screws (B4 × 6)
fixing screws
(B4 × 6)

6. Install the Handle Brackets with the supplied screws (PSW 4 × 16) for these brackets.


fixing screws
(PSW4 × 16)
Bracket
Handle
Bracket
Handle
fixing screws
(PSW4 × 16)

(NOTE) Never use screws (PSW 4 × 16) to install the right and left side panels. Be sure to install the panels with the screws (B 4 × 6) removed in Step (5).
Improperly using the screws (PSW 4 × 16) may cause trouble in the unit.

1-9. SUPPLIED ACCESSORIES

Supplied accessories are as follows :

- AC Power Cord (1 pc)
- 9-pin Remote Cable RCC-5G (1 pc)
- Screws for rack mounting PSW4 × 16 (4 pcs)
- Operation Manual (1 pc)
- Maintenance Manual (VOL-1 and VOL-2)
- Extension Board (2 pcs)
  EX-286 (with 100P connector)
  EX-347 (with 60P connector)

1-10. OPTIONAL ACCESSORIES

The followings are provided as the optional accessories.
Suitable accessories should be used for each system.

- Remote Control Unit : BVR-75A
- TBC Remote Controller : BVR-50P
- Digital Color Corrector : BVX-D10
- Remote Control Cable : RCC-5G (5m), RCC-10G (10m), RCC-30G (30m)
- Digital Audio Cable : ECD-3C (3m), ECD-10C (10m), ECD-30C (30m)
- Rack Mount Kit : RMM-100
  This kit is used to mount the unit in a standard 19-inch rack.
- Cleaning Tape (BCT-5CLN)

SECTION 2
SERVICE INFORMATION

2-1. SPECIFICATIONS

GENERAL

Power requirements : 90 to 265 V AC, 48 to 64 Hz
Power consumption : 210 W
Operating temperature : +5 °C to +40 °C
Storage temperature : −20 °C to +60 °C
Humidity : 80 % or less
Weight : 30 kg
Dimensions : 427×237×549 mm (w/h/d, excluding the projections)
Normal tape speed : 101.51 mm/s
Maximum record/playback time : 100 minutes or longer with a BCT-90ML cassette
Fast forward/rewind time : 180 seconds or less with a BCT-90ML cassette
Search speed
Shuttle mode : 21 steps, still to 42 times normal speed, forward and reverse.
* 42 times ; by setting in setup menu ITEM-102.
Jog mode : Variable from still to normal speed in forward and reverse.
DT (Dynamic tracking) range : −1 to + 3 times normal speed
Recommended cassette tape : 1/2-inch Betacam or Betacam SP cassette
Metal tapes : BCT-5M/10M/20M/30M/
BCT-5ML/10ML/20ML/30ML/60ML/90ML or equivalent
Oxide tapes : BCT-5G/10G/20G/30G/
BCT-5GL/10GL/20GL/30GL/60GL/90GL or equivalent

Video

Video recording Luminance FM
Chrominance FM (Compressed time division multiplex)
Input/output parameter serial, 0.8 Vp-p, 75 Ω ± 1%

		Metal tape		Oxide tape
Bandwidth	Luminance	25 Hz to 5.5 MHz $^{+0.5}_{-3.0}$ dB		25 Hz to 4.0 MHz $^{+0.5}_{-6.0}$ dB
	Color difference	25 Hz to 2.0 MHz $^{+0.5}_{-3.0}$ dB		25 Hz to 1.5 MHz $^{+0.5}_{-3.0}$ dB
S/N ratio*	Luminance	more than 48 dB		more than 46 dB
	Color difference	more than 48 dB		more than 45 dB
Y/C delay		less than 20 ns		less than 20 ns
Pulse shape distortion	Luminance, 2T pulse	K-pulse	less than 1.5 %	less than 3.0 %
		K-pb	less than 1.0 %	—
		K-bar	less than 1.0 %	—
	Color difference, 8T pulse	K-pulse	less than 1.5 %	less than 3.0 %
		K-pb	less than 1.0 %	—
		K-bar	less than 1.0 %	—
Low frequency nonlinearity	Luminance	less than 3.0 %		less than 3.0 %
	Color difference	less than 3.0 %		less than 3.0 %

* SC trap off, 10 kHz to 5 MHz.

All the values in the table were obtained by playing back a tape on which component signals were recorded and measuring the signals through a standard D/A convertor.

Audio

Audio recording Channels 1 and 2 : Bias
Channels 3 and 4 : FM

			Metal tape	**Oxide tape**
LNG	Frequency response (20 dB below peak level*)		40 Hz to 15 kHz $^{+1.0}_{-2.0}$ dB	40 Hz to 15 kHz ±3.0 dB
	S/N ratio (at peak level* weighted CCIR 468-3)		more than 68 dB	more than 62 dB
	Distortion (K-3, at 1 kHZ)	At peak level*	less than 3 %	less than 3 %
		At operation level (+4 dBm)	less than 1 %	less than 1 %
	Crosstalk (at 1 kHz)		less than −71 dB	less than −60 dB
	Stereo phase (at 15 kHz)		less than 20°	less than 45°
	Erasure depth (at 1 kHz)		more than 65 dB	more than 65 dB
	Wow and flutter (DIN45507)		less than 0.1 %	less than 0.1 %
AFM	Frequency response (20 dB below peak level**)		20 Hz to 20 kHz $^{+0.5}_{-2.0}$ dB	—
	S/N ratio (at peak level** weighted CCIR 468-3)		more than 72 dB	—
	Distortion (K-3, at 1 kHz)	At peak level**	less than 3 %	—
		At operation level (+4 dBm)	less than 0.6 %	—
	Crosstalk (at 100 Hz to 12.5 kHz)		less than −70 dB	—
	Stereo phase (at 20 kHz)		less than 10°	—

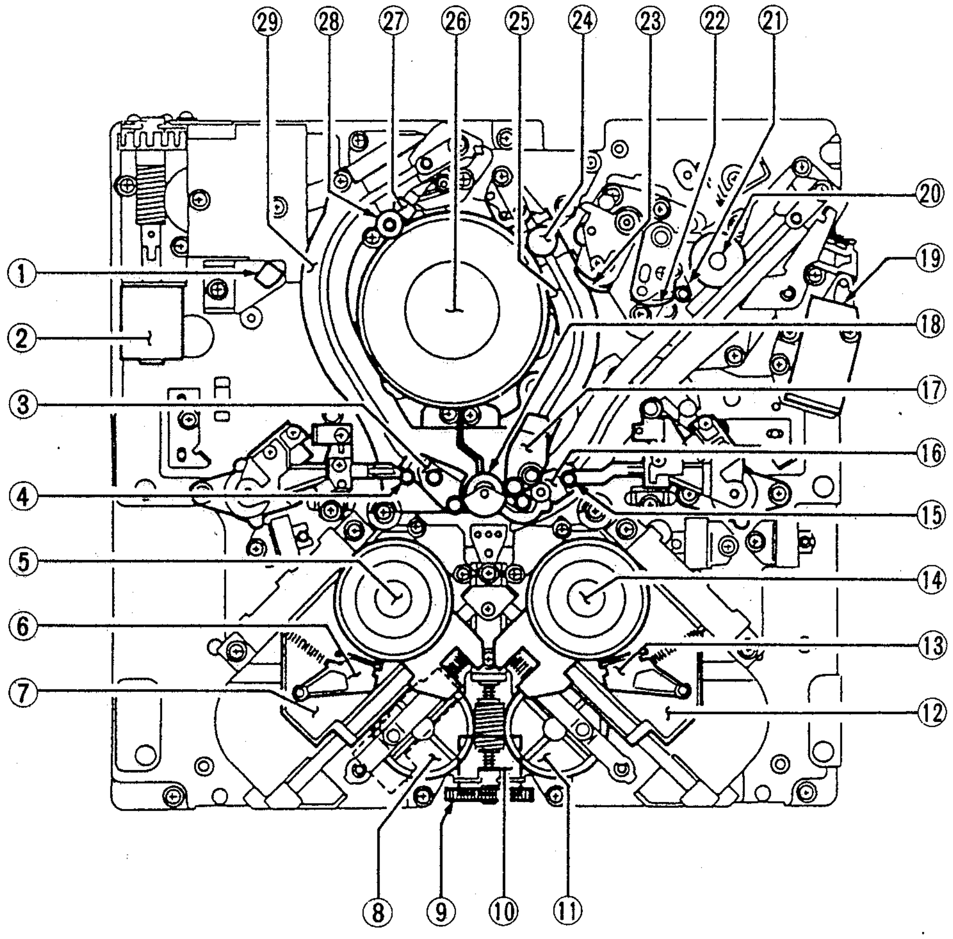
* Peak level : +8 dB above operation level
** Peak level : +19 dB above operation level
Unless otherwise specified, all the values in the table were obtained by measuring analog output signals with Dolby noise reduction circuitry on.

Processor adjustment range

Video level : ± 3 dB
Chroma level : ± 3 dB
Black level : 0 to 100 mV
System sync phase : $^{+3}_{-1}$ μs
Y/C delay : ± 100 ns

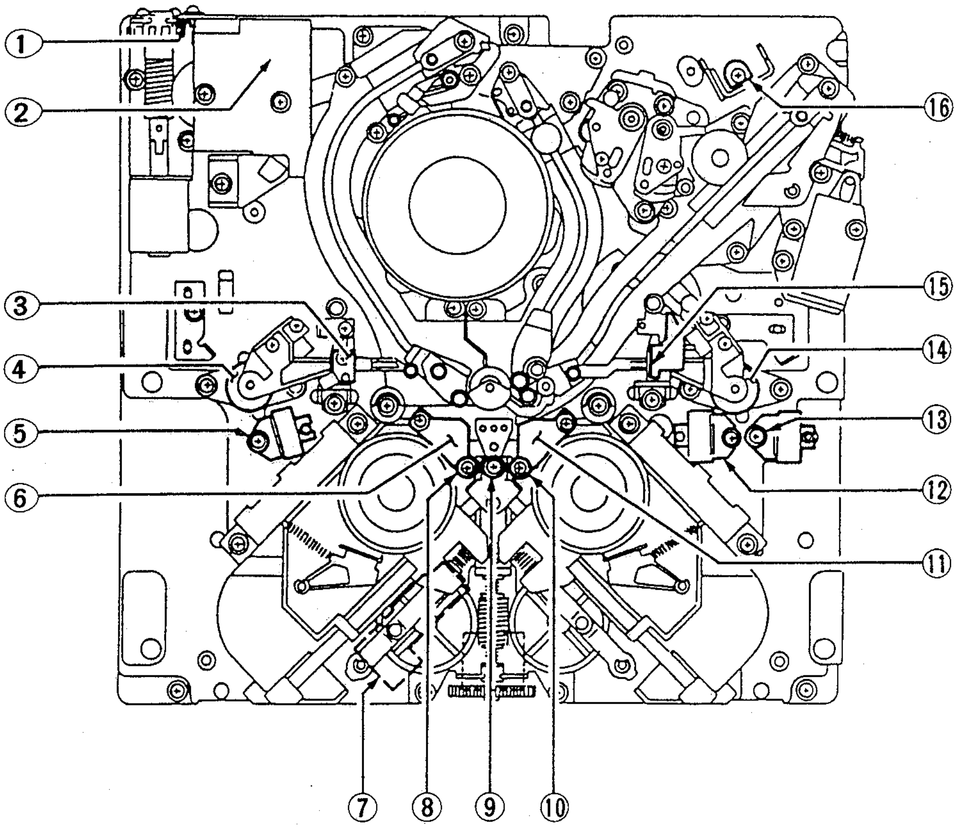
* Dolby noise reduction manufactured under licence from Dolby Laboratories Licensing Corporation. "DOLBY" and the double-D symbol DD are trademarks of Dolby Laboratories Licensing Corporation.

2-2-2. Location of Mechanical Parts/Components



① Full erase head
② Threading motor
③ S slider
④ S tension regulator arm
⑤ S reel table
⑥ S brake
⑦ S reel motor plate
⑧ S worm wheel
⑨ Reel shift driver gear
⑩ Reel shift motor
⑪ T worm wheel
⑫ T reel motor plate
⑬ T brake
⑭ T reel table
⑮ T tension reulator arm
⑯ P slider
⑰ T slider
⑱ Pinch roller
⑲ Pinch solenoid
⑳ Capstan shaft
㉑ TG-6 tape guide
㉒ Confidence head
㉓ Audio/TC head
㉔ Cleaning roller
㉕ T rail
㉖ Head drum
㉗ CTL head
㉘ TG-4 tape guide
㉙ S rail

2-2-3. Location of Sensor (1)



① Threading motor rotation detection sensor
Threading motor rotation detection sensor detects the rotation speed of the threading motor.
The FG output signal of this sensor inputs to servo circuit, and controls the threading speed to protects the tape from damage.

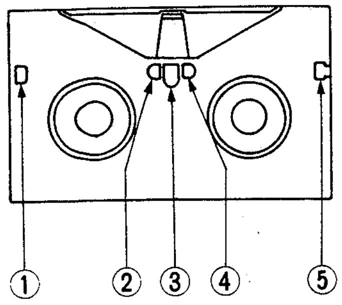
② Threading-end/unthreading-end detection sensor
This sensor detects whether the threading ring reaches the threading-end or unthreading-end position.

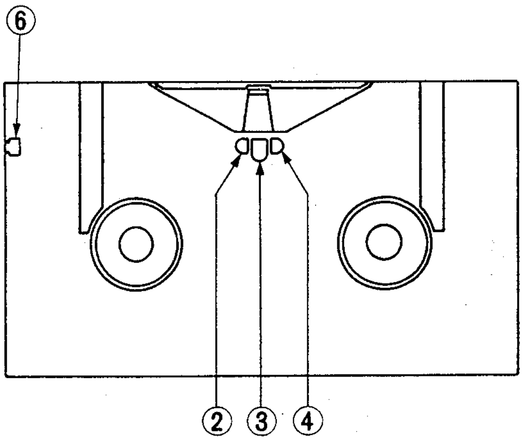
③ Tape end sensor
During tape travelling in the FWD direction, tape end sensor detects the end of tape.

④ S tension regulator arm sensor
During recording or playback, S tension regulator arm activates to keep a constant tape tension.
S tension regulator arm sensor detects the position of the S tension regulator arm.

2-2-5. Function of the Cassette Plug and Tab

As shown in the figure below, plugs and tabs are provided at the back side of the cassette tape.





① S cassette Miss-REC tab (for oxide tape)
② Video tape thickness detection tab
③ Oxide/metal particle tape detection tab
④ Reel hub diameter detection tab
⑤ S cassette Miss-REC plug (for metal particle tape)
⑥ L cassette Miss-REC plug

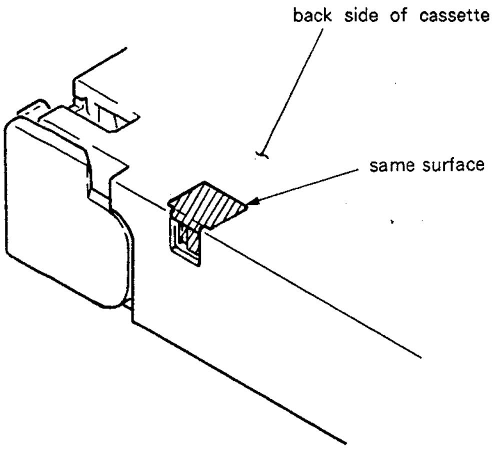

back side of cassette
same surface

Fig. 1

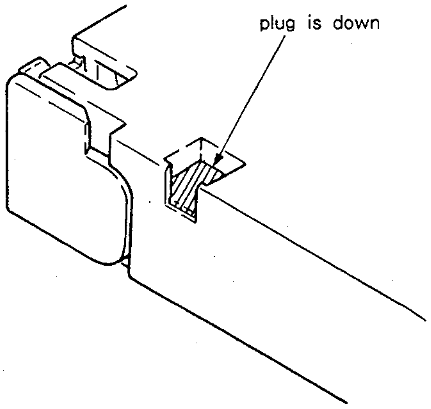

plug is down

Fig. 2

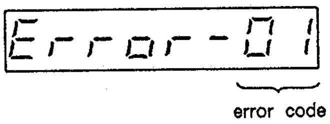
The presence of absence of these plugs and tabs determines the cassette status as shown in the table below.

Plug and tab	**Cassette status with plugs and tabs**	**Cassette status without plugs and tabs**
S cassette Miss-REC tab (for oxide tape)	Can be recorded (refer to Fig.1)	Cannot be recorded (refer to Fig.2)
S cassette Miss-REC plug (for metal particle tape)	Can be recorded (refer to Fig.1)	Cannot be recorded (refer to Fig.2)
L cassette Miss-REC plug	Can be recorded (refer to Fig.1)	Cannot be recorded (refer to Fig.2)
Tape thickness detection tab	A 20μm thick tape is wound on the cassette	A 15μm thick tape is wound on the cassette
Oxide/metal particle tape detection tab	An oxide tape is wound on the cassette	A metal particle tape is wound on the cassette
Reel hub diameter detection tab	For small hub	For large hub

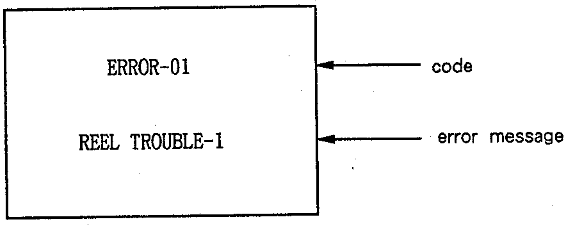
2-3. ERROR MESSAGE

This unit features self-diagnostics.
When trouble is detected, an error code is displayed immediately in the time counter display on the control panel, an error code and message are displayed on the video monitor display.
Furthermore, as for the interface error (error code 92,93), interface object which error occured replaced by sub error massage on the video monitor display.
(To display error code and message on the monitor, the monitor must be connected to the MONITOR OUT connector, and the CHARACTER switch on the sub control panel must be set to ON.)

Time counter display

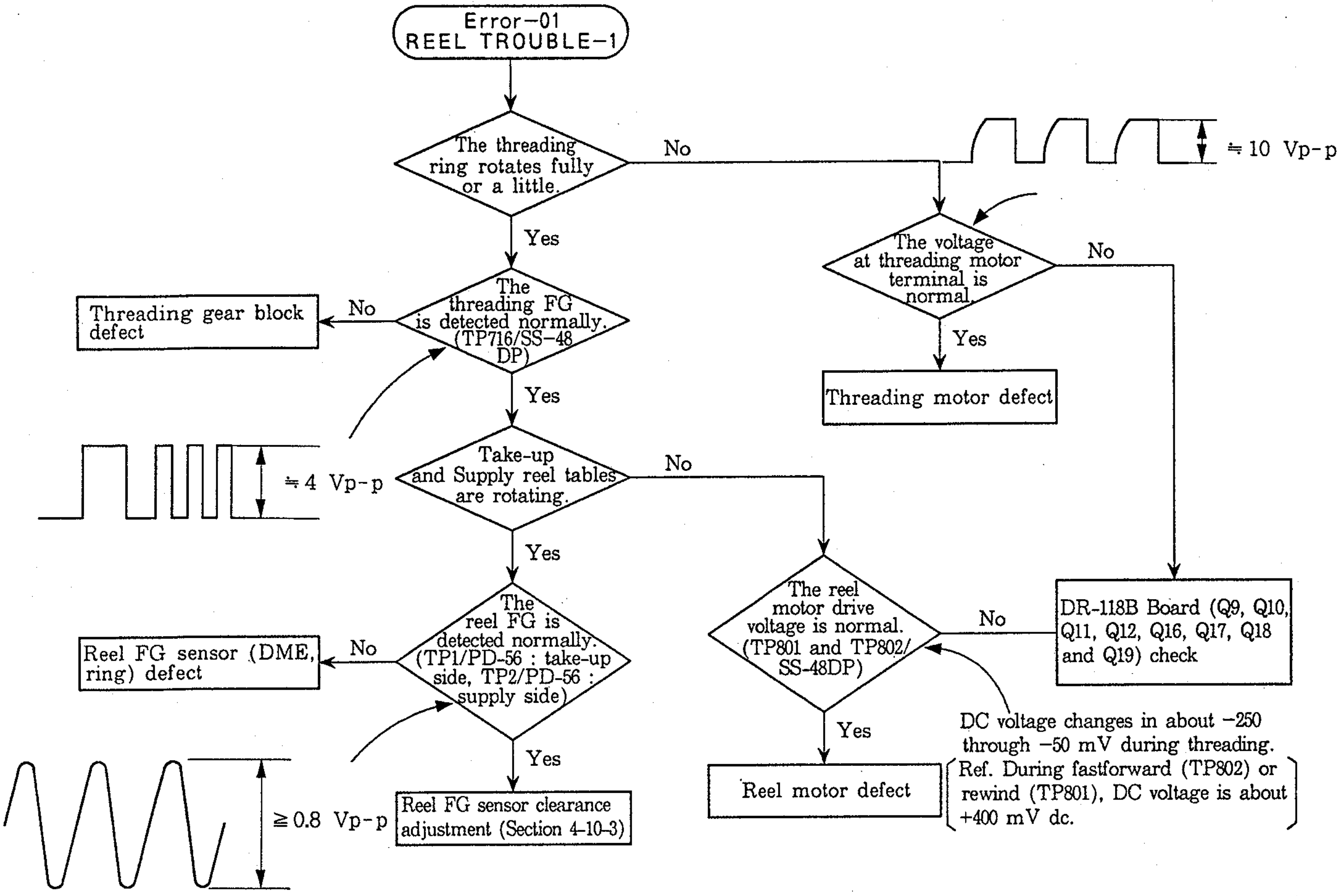


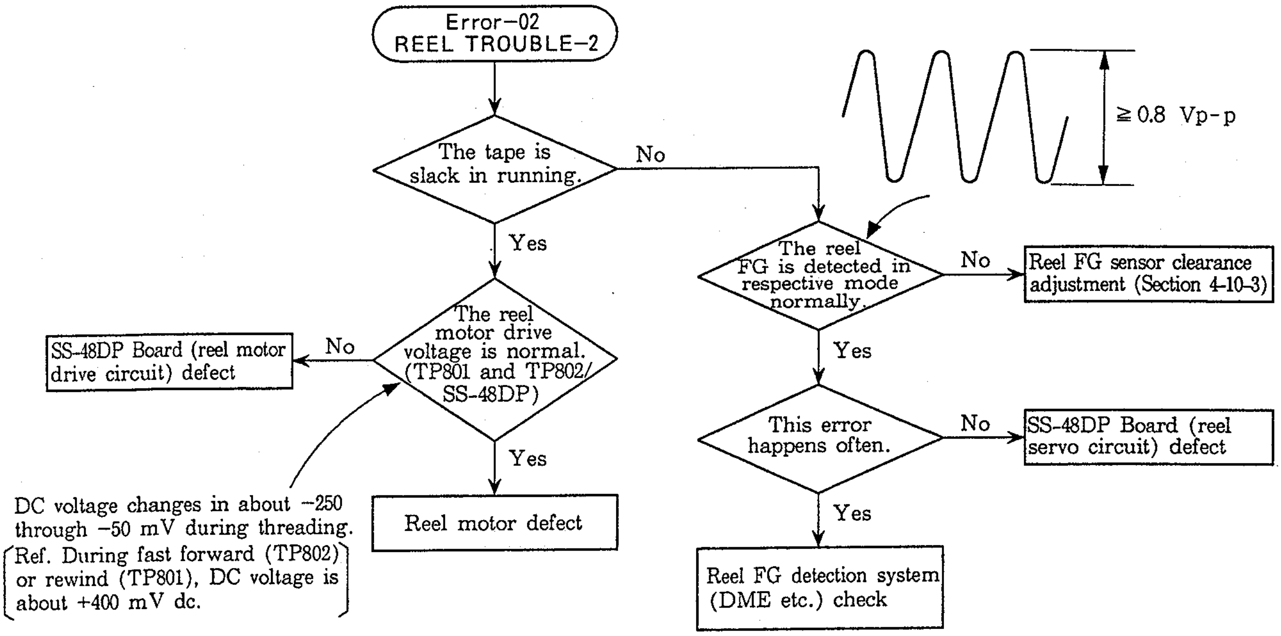
Video monitor display

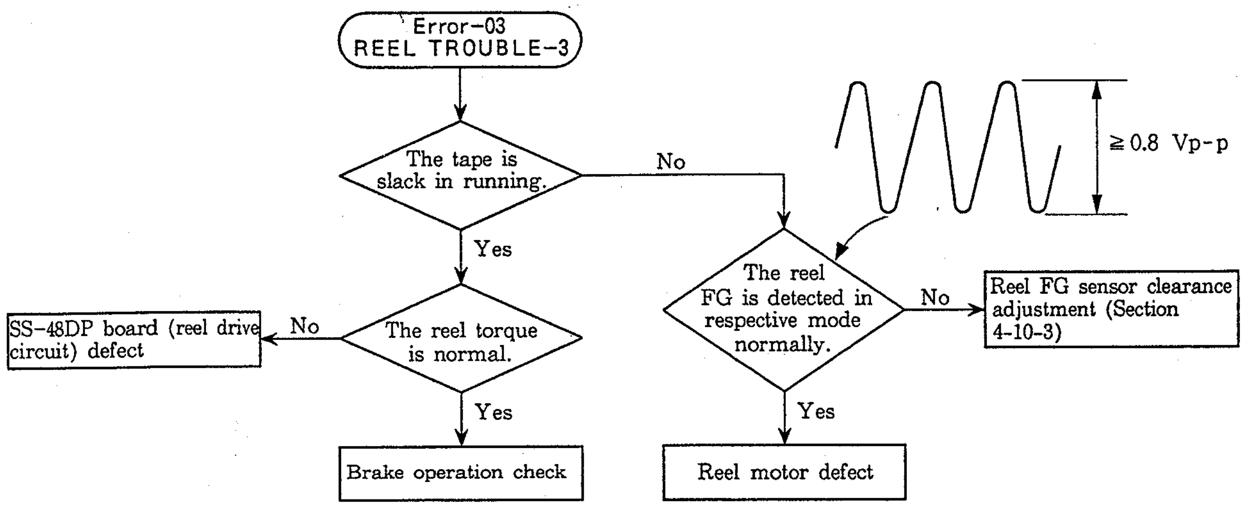


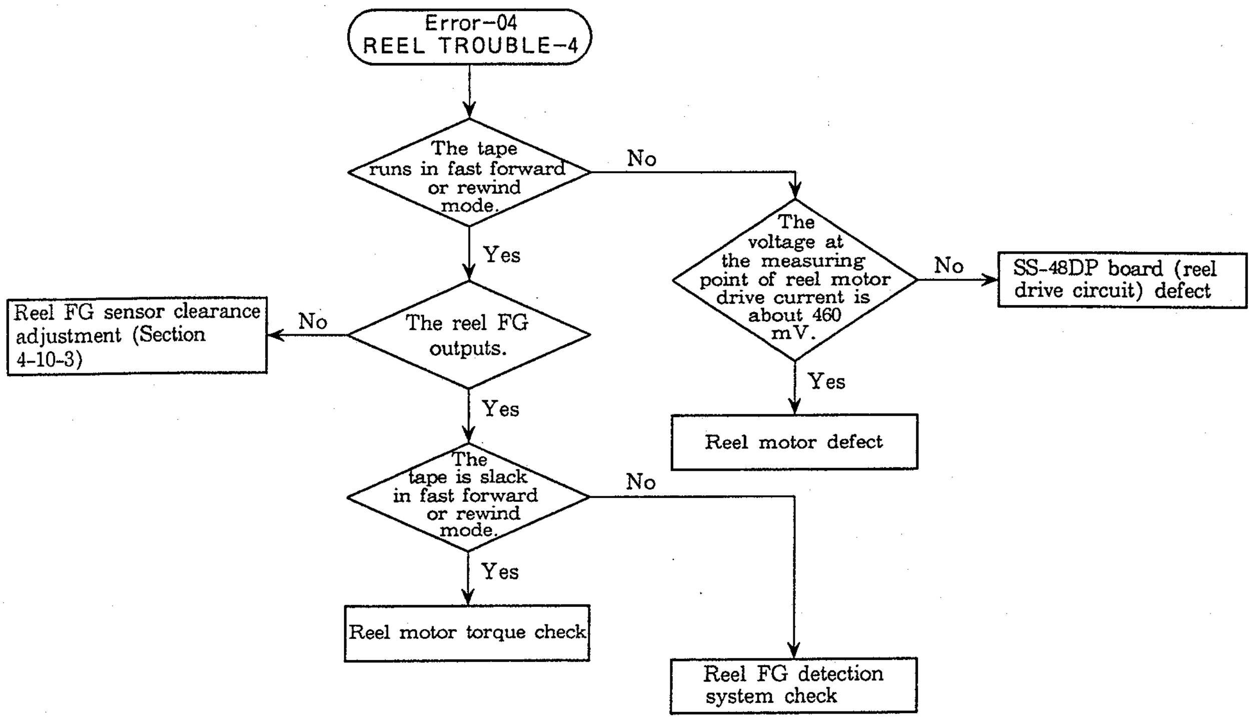
code	error message	description	detection
01	**REEL TROUBLE-1**	The slack of the tape is detected during threading or unthreading, and then tape protection is done.	Detected when the ratio of the FG frequency at a supply reel, take-up reel and threading ring is less than the specified value.
02	**REEL TROUBLE-2**	The slack or breaking of the tape is detected in search, fast foward, or rewind mode, and then tape protection is done.	Detected when the ratio of the FG frequency at a supply reel and take-up reel is less than the specified value.
03	**REEL TROUBLE-3**	The slack or breaking of the tape is detected in recording or playback mode, or either of the lock of the supply or take-up reel is detected, and then tape protection is done.	Detected when the FG frequency at a supply or take-up reel is zero (0), or when the tension detected from a tension sensor is less than 15 g.
04	**REEL TROUBLE-4**	It is detected that the tape does not run at the speed of designation in fast forward or rewind mode, and then tape protection is done.	Depends on the comparison between the tape speed using the FG frequency at supply and take-up reels and the designated speed.
05	**REEL TROUBLE-5**	It is detected that the supply or take-up reel cannot stop with a cassette is not inserted, or detected that over current has been flowing to supply and take-up reels.	Detected using the FG frequency or current at supply and take-up reels.
06	**TAPE TENSION ERROR**	When excessive tension is detected, tape protection is done.	Detected when the tension detected from a tension sensor is more than 55 g.
07	**CAPSTAN TROUBLE**	It is detected that the tape does not run at the speed of designation in play or search mode, and tape protection is done.	Detected at the tape speed detected from the FG frequency at a capstan motor.
08	**DRUM TROUBLE**	It is detected that drum motor rotation is not normal, and then tape protection is done.	Detected when the drum speed obtained from the speed FG of the drum motor is less than the specified value.
09	**TH/UNTH MOTOR TIME OUT**	It is detected that threading or unthreading is not completed, and then tape protection is done.	Detected when threading or unthreading is not completed within ten seconds after it is started.

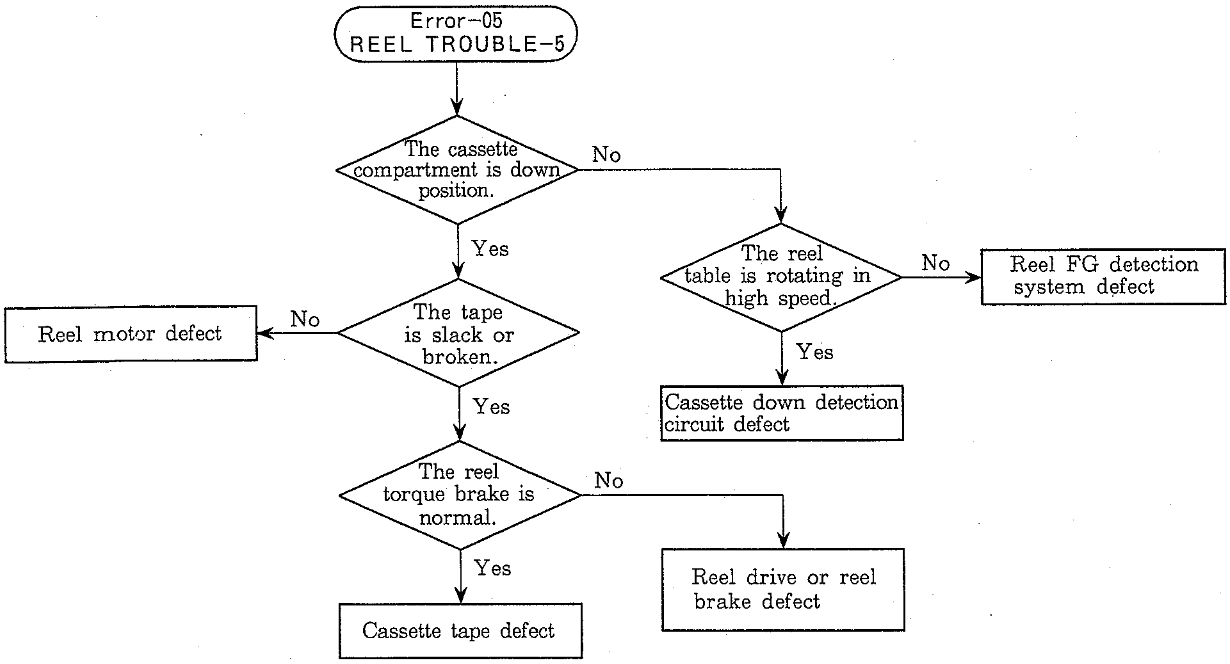
code	error message	description	detection
0A	**THREADING TROUBLE**	It is detected that threading cannot be done, and then tape protection is done.	Detected when the tape beginning sensor is acted during threading after the short FF mode is automatically entered three times.
10	**HUMID**	Condensation is detected.	Detected using a condensation sensor.
11	**TAPE BEGINNING/END SENSOR TROUBLE**	The tape beginning or end sensor operation is defective.	Detected when the tape beginning and end are detected at the same time.
12	**TAPE BEGINNING SENSOR TROUBLE**	The tape beginning sensor operation is defective.	Detected when the tape beginning continues for more than seven seconds.
13	**TAPE END SENSOR TROUBLE**	The tape end sensor operation is defective.	Detected when the tape end continues for more than seven seconds.
14	**FAN MOTOR TROUBLE**	The operation of the fan motor is defective.	Detected according to the period of a ripple noise at the fan motor terminal.
20	**CASSETTE COMPARTMENT MOTOR LOCK**	It is detected that cassette up/down operation is not completed, and then tape protection is done.	Detected when cassette up/down operation is not completed within four seconds after it is started.
21	**REEL TABLE MOTOR LOCK**	It is detected that driving of the L position to S position or the S position to L position in the reel table is not completed, and then tape protection operation is done.	Detect when reel table driving is not completed within four seconds after it is started.
22	**REEL TABLE SENSOR TROUBLE**	The operation of the L/S position detection sensor of the reel table is defective.	Detected when the L and S positions are detected at the same time.
90	**KEY INTERFACE ERROR**	The interface between the keyboard and system control is defective.	Detected when no interface signal is sent from the system control to the keyboard.
91	**1/2 VD NOT EXIST**	No 1/2 VD signal input to system control is detected.	Detected when no 1/2 VD signal input to system control.
92	**INTERNAL SERIAL INTERFACE ERROR** **sub error message** **SWC-10** **SWC-12** **MDM** **TBC** **DIF (SIF)**	The serial interface between SWC-10, SWC-12, MDM-15, TBC-17, DIF-11 boards and system control is defective. SWC-10 : IC2/SWC-10 SWC-12 : IC1, IC2/SWC-12P MDM : IC901/MDM-5P TBC : IC722/TBC-17P DIF (SIF) : IC5/SIF-17	Detected when no interface signal is sent from the each board to the system control three times continuously.
93	**CPU INITIALIZE ERROR** **sub error message** **servo (main)** **servo (sub)** **time code** **DT**	The interface between the time code and system control, or the servo and system control is defective when the POWER switch is turned ON. servo (main) : IC604/SS-48DP servo (sub) : IC710/SS-48DP time code : IC403/SS-48DP DT : IC5/DT-28	Detected when the interface signal from the time code or servo system to the system control when the POWER switch is turned ON is defect.
96	**SY NV-RAM TROUBLE** **sub error message** **SWC-10** **SWC-12** **MDM** **TBC**	The operational defect of the NV-RAM (setup menu data) is detected. Then, reset the data in the NV-RAM to the condition at exfactory. SWC-10 : IC2/SWC-10 SWC-12 : IC12/SWC-12P MDM : IC901/MDM-5P TBC : IC722/TBC-17P	Detected by the NV-RAM data's checksum.
97	**SV NV-RAM TROUBLE**	The operational defect of the NV-RAM (servo adjustment data) is detected on the DR-118B board.	Detected by the NV-RAM data's checksum.

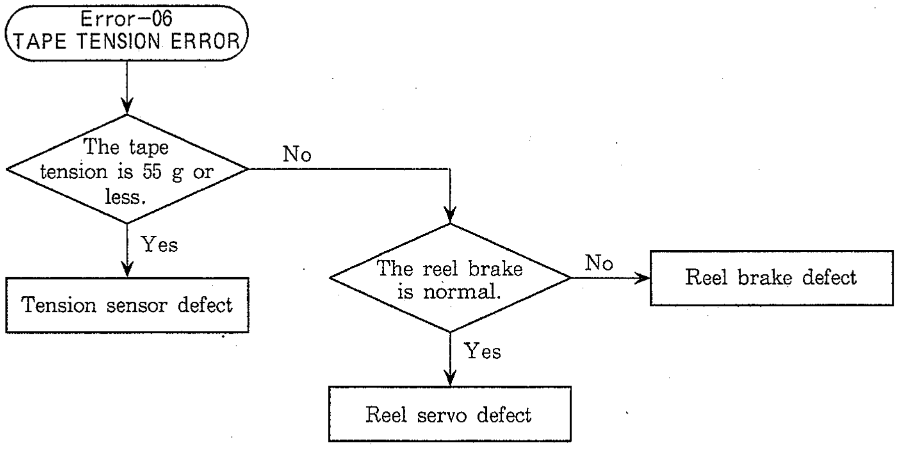

Error-01
REEL TROUBLE-1
The threading ring rotates fully or a little.
No
≒10 Vp-p
The voltage at threading motor terminal is normal.
No
Yes
Threading motor defect
Yes
The threading FG is detected normally. (TP716/SS-48 DP)
No
Threading gear block defect
Yes
≒4 Vp-p
Take-up and Supply reel tables are rotating.
No
Yes
The reel FG is detected normally. (TP1/PD-56 : take-up side, TP2/PD-56 : supply side)
No
Reel FG sensor (DME, ring) defect
Yes
≧0.8 Vp-p
Reel FG sensor clearance adjustment (Section 4-10-3)
The reel motor drive voltage is normal. (TP801 and TP802/ SS-48DP)
No
DR-118B Board (Q9, Q10, Q11, Q12, Q16, Q17, Q18 and Q19) check
Yes
Reel motor defect
DC voltage changes in about −250 through −50 mV during threading.
Ref. During fastforward (TP802) or rewind (TP801), DC voltage is about +400 mV dc.

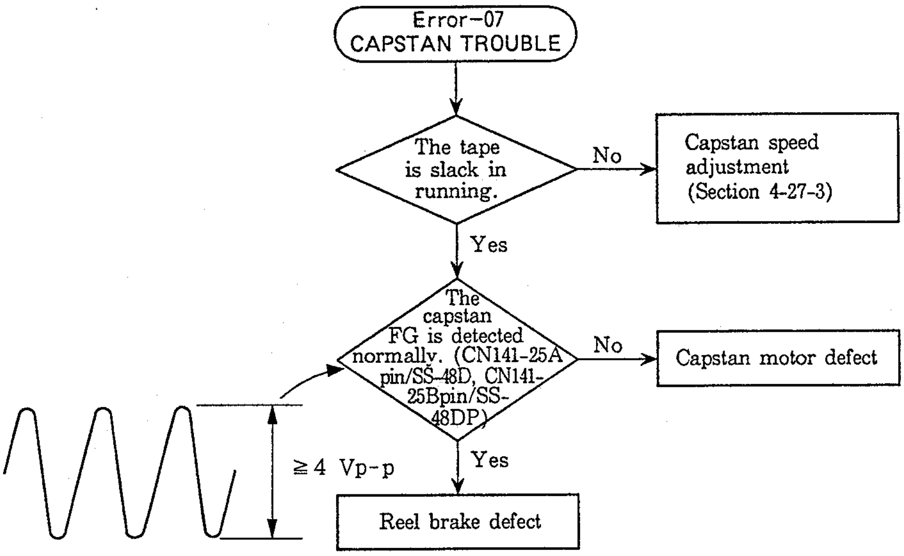

Error-02
REEL TROUBLE-2
The tape is slack in running.
No
≧0.8 Vp-p
The reel FG is detected in respective mode normally.
No
Reel FG sensor clearance adjustment (Section 4-10-3)
Yes
This error happens often.
No
SS-48DP Board (reel servo circuit) defect
Yes
Reel FG detection system (DME etc.) check
Yes
The reel motor drive voltage is normal. (TP801 and TP802/ SS-48DP)
No
SS-48DP Board (reel motor drive circuit) defect
Yes
Reel motor defect
DC voltage changes in about −250 through −50 mV during threading.
Ref. During fast forward (TP802) or rewind (TP801), DC voltage is about +400 mV dc.

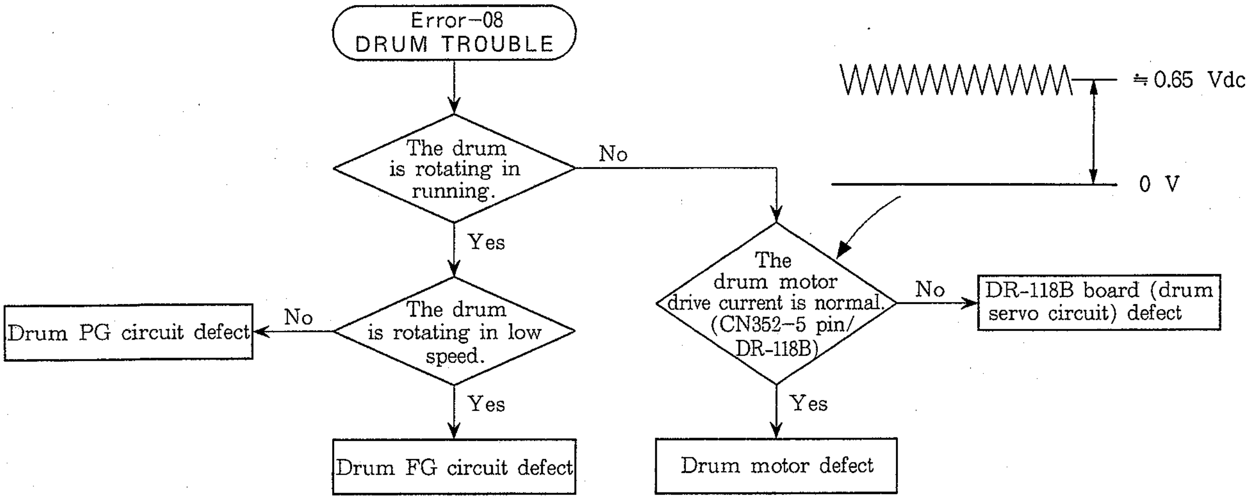

Error−03
REEL TROUBLE−3
The tape is slack in running.
No
Yes
The reel torque is normal.
No
SS−48DP board (reel drive circuit) defect
Yes
Brake operation check
≧0.8 Vp-p
The reel FG is detected in respective mode normally.
No
Reel FG sensor clearance adjustment (Section 4-10-3)
Yes
Reel motor defect

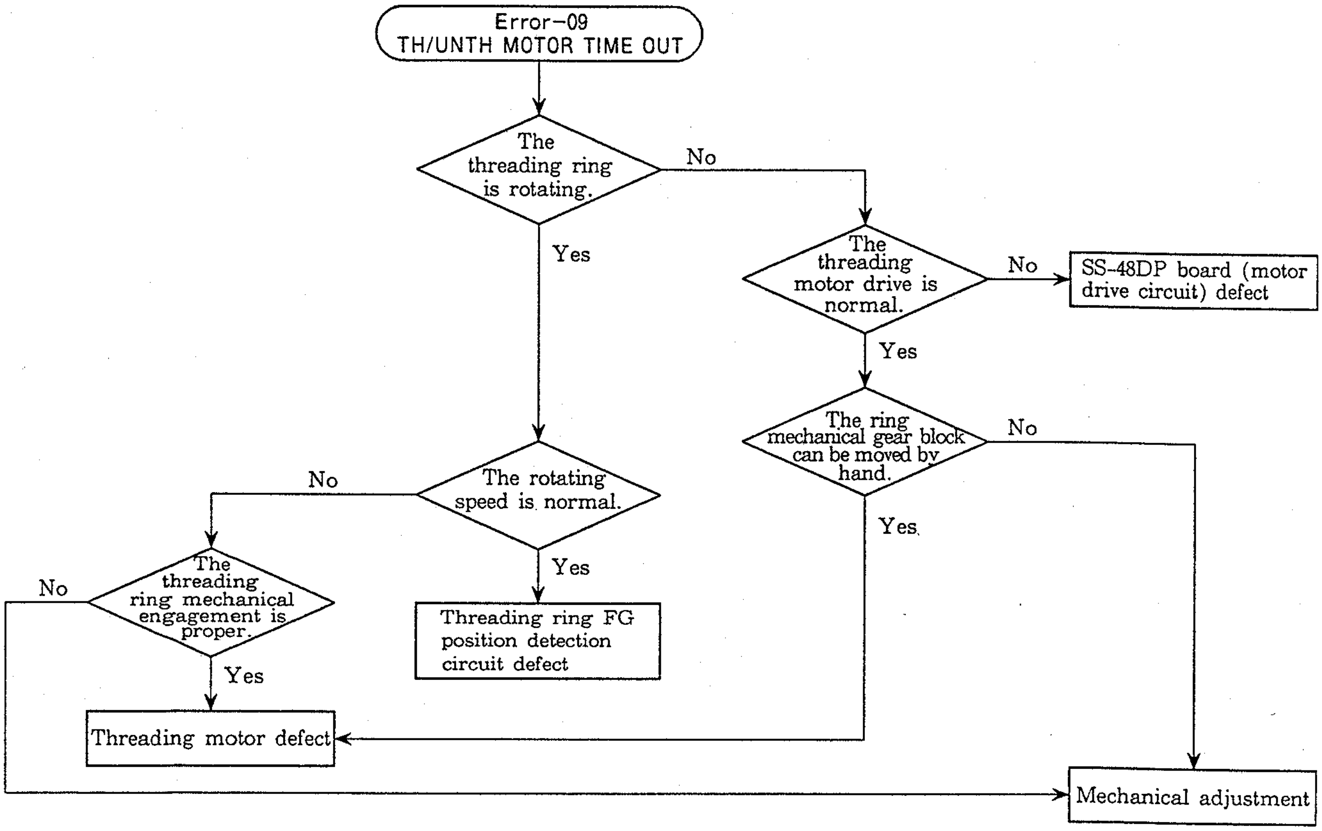

Error−04
REEL TROUBLE−4
The tape runs in fast forward or rewind mode.
No
Yes
The reel FG outputs.
No
Reel FG sensor clearance adjustment (Section 4-10-3)
Yes
The tape is slack in fast forward or rewind mode.
Yes
Reel motor torque check
No
Reel FG detection system check
The voltage at the measuring point of reel motor drive current is about 460 mV.
No
SS-48DP board (reel drive circuit) defect
Yes
Reel motor defect

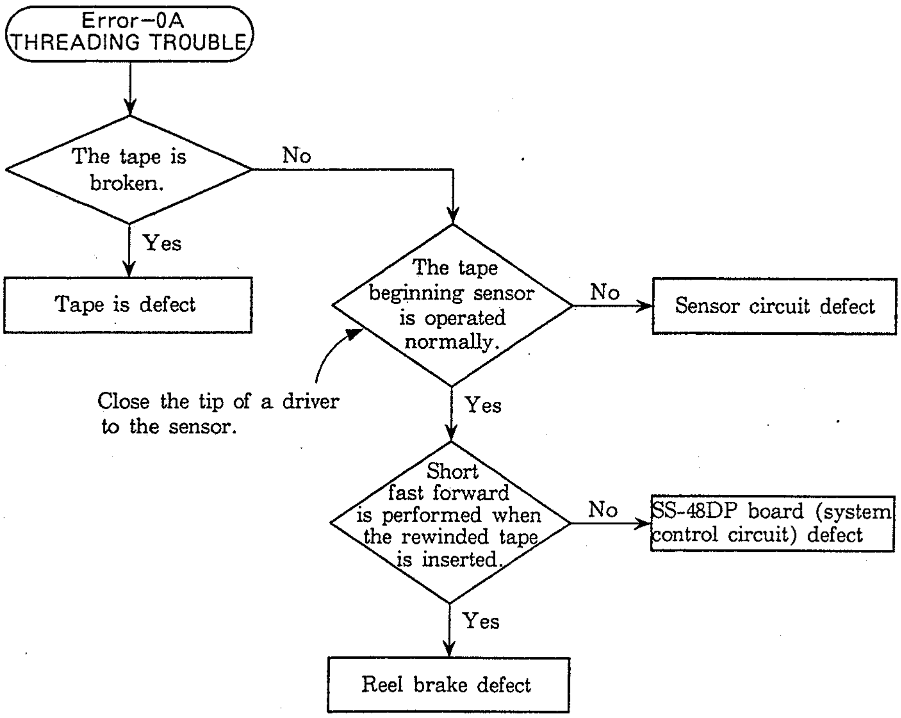

Error−05
REEL TROUBLE−5
The cassette compartment is down position.
No
The reel table is rotating in high speed.
No
Reel FG detection system defect
Yes
Cassette down detection circuit defect
Yes
The tape is slack or broken.
No
Reel motor defect
Yes
The reel torque brake is normal.
No
Reel drive or reel brake defect
Yes
Cassette tape defect

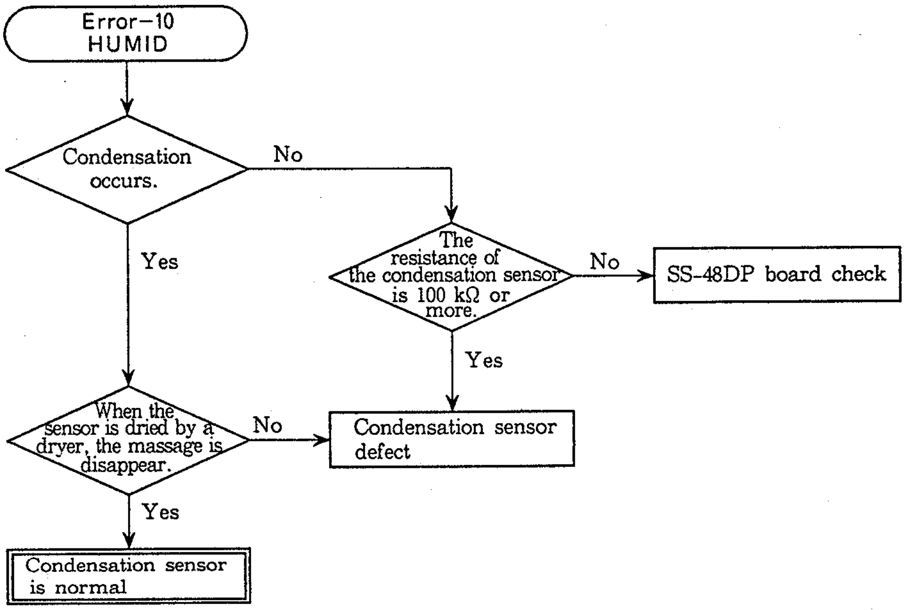

Error−06
TAPE TENSION ERROR
The tape tension is 55 g or less.
Yes
Tension sensor defect
No
The reel brake is normal.
No
Reel brake defect
Yes
Reel servo defect

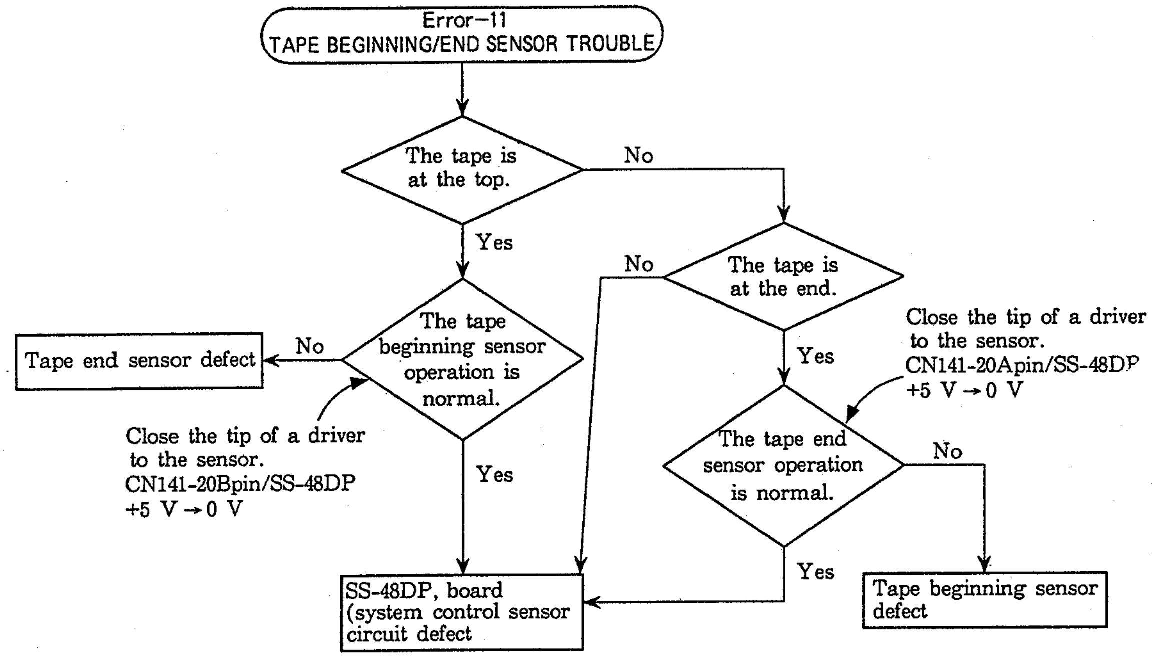

Error–07
CAPSTAN TROUBLE
The tape is slack in running.
No
Capstan speed adjustment (Section 4-27-3)
Yes
The capstan FG is detected normally. (CN141-25A pin/SS-48D, CN141-25Bpin/SS-48DP)
No
Capstan motor defect
≧4 Vp-p
Yes
Reel brake defect

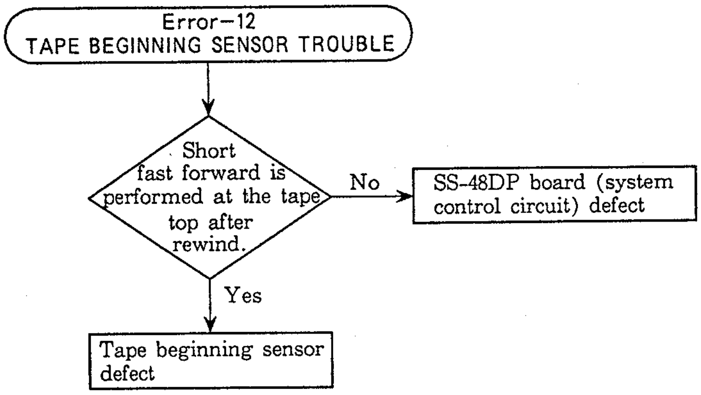

Error–08
DRUM TROUBLE
≒0.65 Vdc
0 V
The drum is rotating in running.
No
Yes
The drum motor drive current is normal. (CN352–5 pin/ DR-118B)
No
DR-118B board (drum servo circuit) defect
Drum PG circuit defect
No
The drum is rotating in low speed.
Yes
Yes
Drum FG circuit defect
Drum motor defect

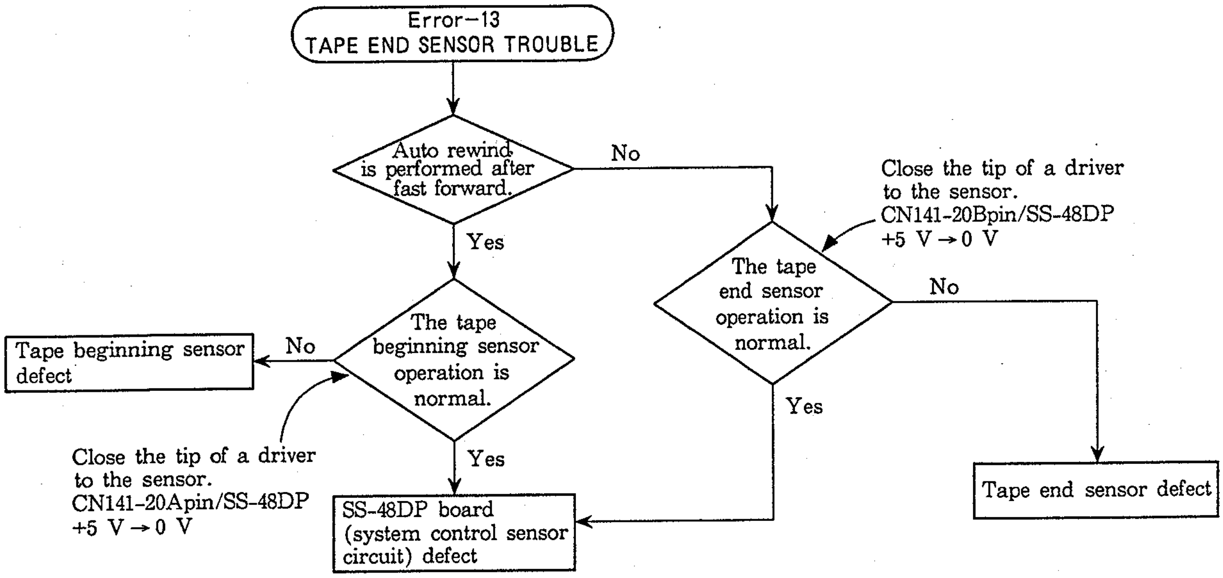

Error–09
TH/UNTH MOTOR TIME OUT
The threading ring is rotating.
No
Yes
The threading motor drive is normal.
No
SS-48DP board (motor drive circuit) defect
Yes
The ring mechanical gear block can be moved by hand.
No
Yes
The rotating speed is normal.
No
Yes
The threading ring mechanical engagement is proper.
No
Yes
Threading ring FG position detection circuit defect
Threading motor defect
Mechanical adjustment

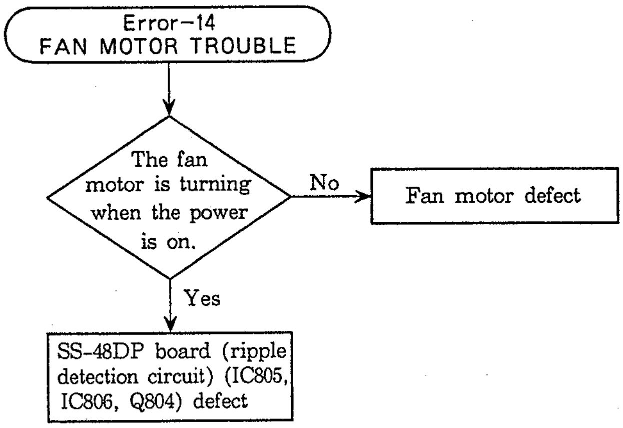

Error–0A
THREADING TROUBLE
The tape is broken.
No
Yes
Tape is defect
The tape beginning sensor is operated normally.
No
Sensor circuit defect
Close the tip of a driver to the sensor.
Yes
Short fast forward is performed when the rewinded tape is inserted.
No
SS-48DP board (system control circuit) defect
Yes
Reel brake defect

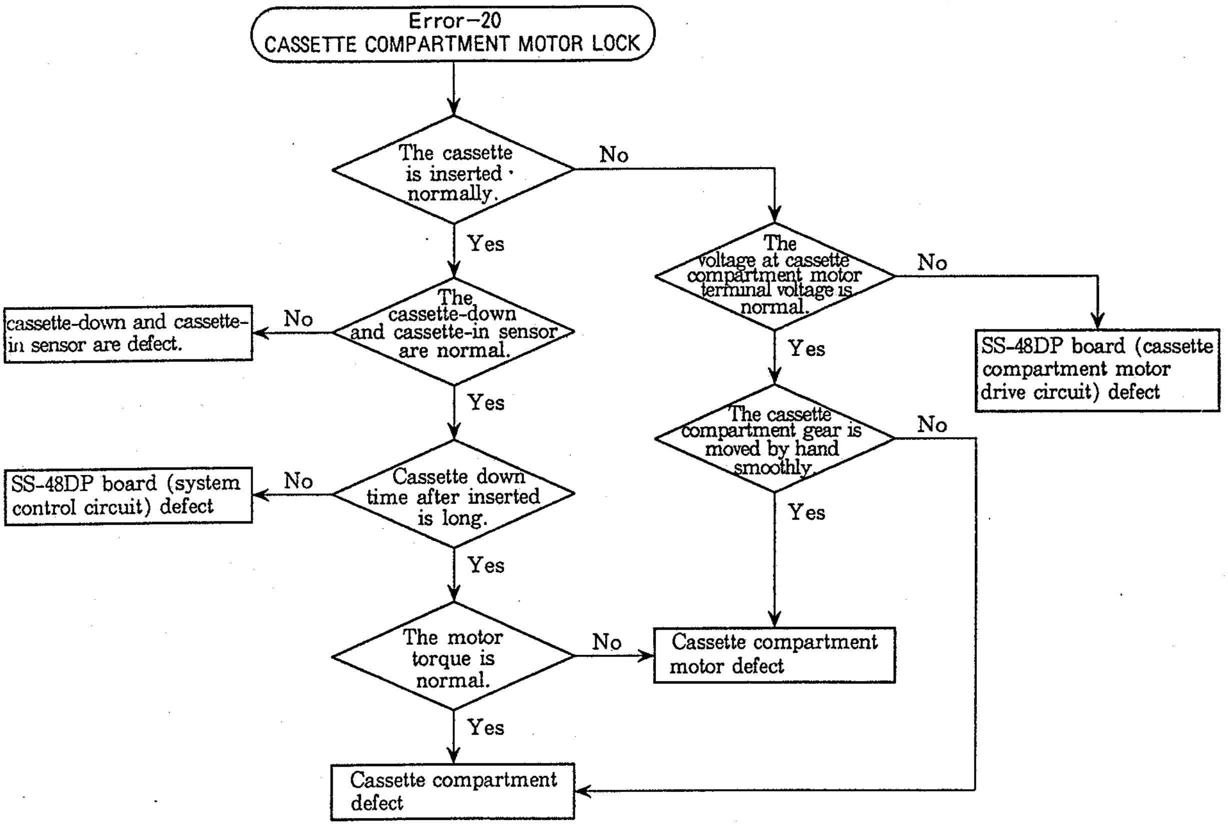

Error-10
HUMID
Condensation occurs.
No
The resistance of the condensation sensor is 100 kΩ or more.
No
SS-48DP board check
Yes
Yes
When the sensor is dried by a dryer, the massage is disappear.
No
Condensation sensor defect
Yes
Condensation sensor is normal

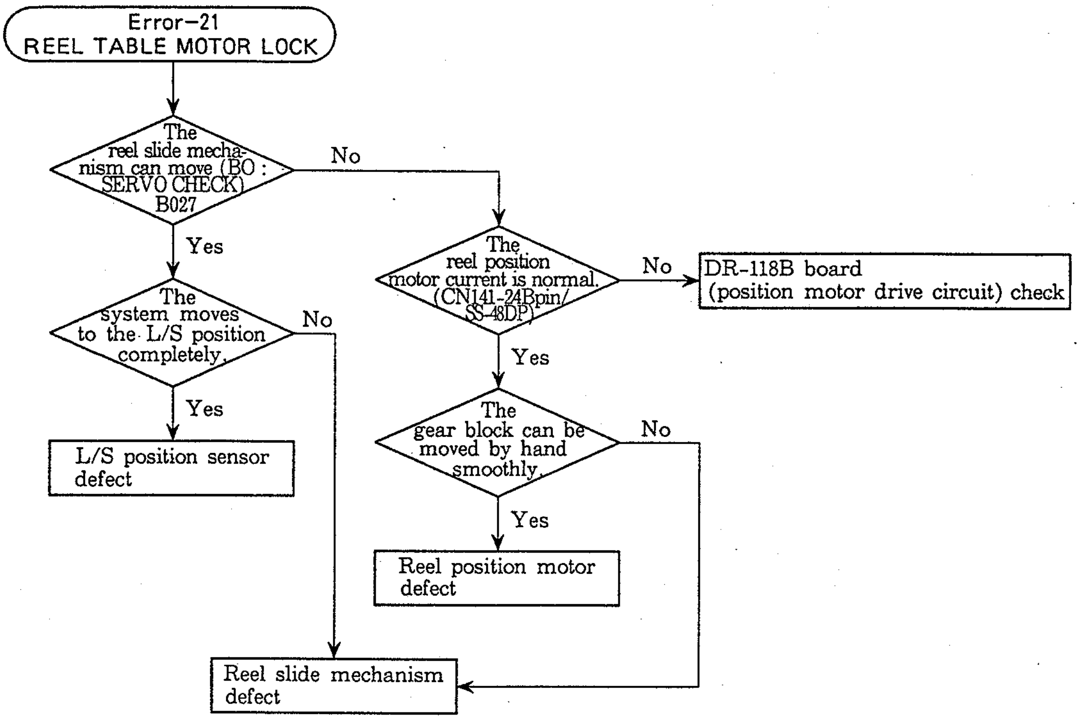

Error-11
TAPE BEGINNING/END SENSOR TROUBLE
The tape is at the top.
No
Yes
No
The tape is at the end.
The tape beginning sensor operation is normal.
No
Tape end sensor defect
Close the tip of a driver to the sensor.
CN141-20Bpin/SS-48DP
+5 V → 0 V
Yes
Close the tip of a driver to the sensor.
CN141-20Apin/SS-48DP
+5 V → 0 V
The tape end sensor operation is normal.
No
Yes
SS-48DP, board (system control sensor circuit defect
Yes
Tape beginning sensor defect

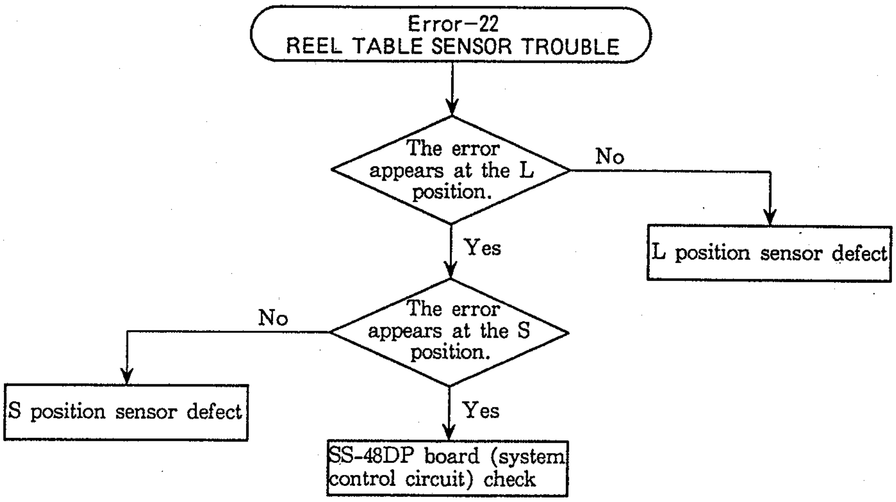

Error−12
TAPE BEGINNING SENSOR TROUBLE
Short fast forward is performed at the tape top after rewind.
No
SS-48DP board (system control circuit) defect
Yes
Tape beginning sensor defect

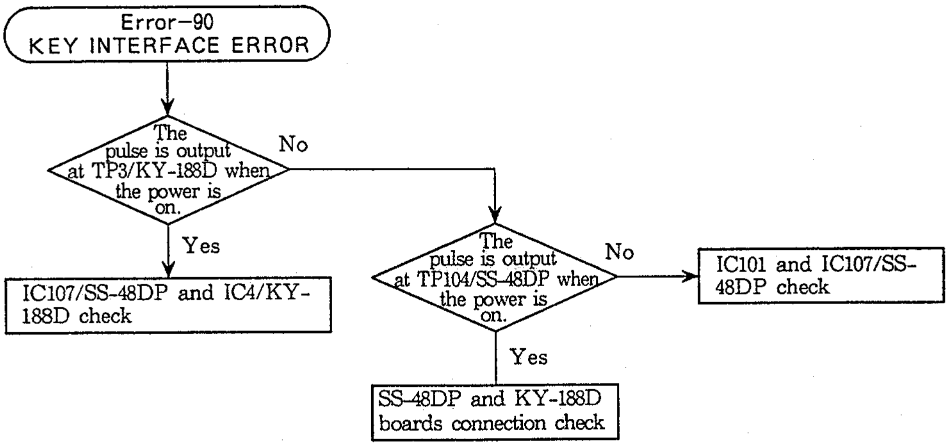

Error−13
TAPE END SENSOR TROUBLE
Auto rewind is performed after fast forward.
No
Yes
Close the tip of a driver to the sensor.
CN141-20Bpin/SS-48DP
+5 V→0 V
The tape end sensor operation is normal.
No
Yes
Tape beginning sensor defect
No
The tape beginning sensor operation is normal.
Close the tip of a driver to the sensor.
CN141-20Apin/SS-48DP
+5 V→0 V
Yes
SS-48DP board (system control sensor circuit) defect
Tape end sensor defect

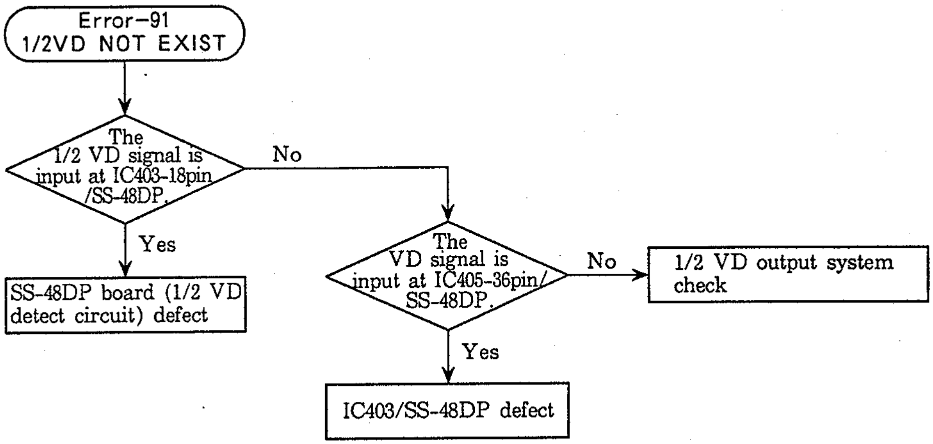

Error-14
FAN MOTOR TROUBLE
The fan motor is turning when the power is on.
No
Fan motor defect
Yes
SS-48DP board (ripple detection circuit) (IC805, IC806, Q804) defect

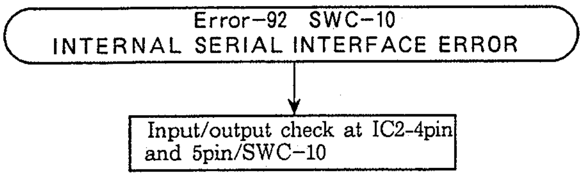

Error-20
CASSETTE COMPARTMENT MOTOR LOCK
The cassette is inserted normally.
No
The voltage at cassette compartment motor terminal voltage is normal.
No
SS-48DP board (cassette compartment motor drive circuit) defect
Yes
The cassette compartment gear is moved by hand smoothly.
No
Yes
Yes
The cassette-down and cassette-in sensor are normal.
No
cassette-down and cassette-in sensor are defect.
Yes
Cassette down time after inserted is long.
No
SS-48DP board (system control circuit) defect
Yes
The motor torque is normal.
No
Cassette compartment motor defect
Yes
Cassette compartment defect

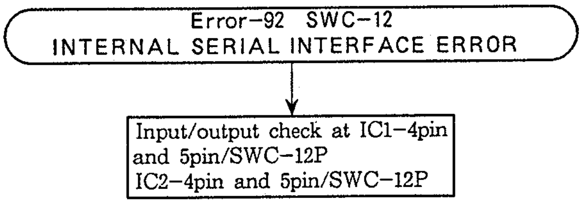

Error–21
REEL TABLE MOTOR LOCK
The reel slide mechanism can move (BO : SERVO CHECK) B027
No
Yes
The system moves to the L/S position completely.
No
Yes
L/S position sensor defect
The reel position motor current is normal. (CN141-24Bpin/SS-48DP)
No
DR-118B board (position motor drive circuit) check
Yes
The gear block can be moved by hand smoothly.
No
Yes
Reel position motor defect
Reel slide mechanism defect

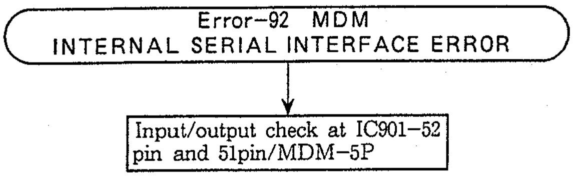

Error–22
REEL TABLE SENSOR TROUBLE
The error appears at the L position.
No
L position sensor defect
Yes
The error appears at the S position.
No
S position sensor defect
Yes
SS-48DP board (system control circuit) check

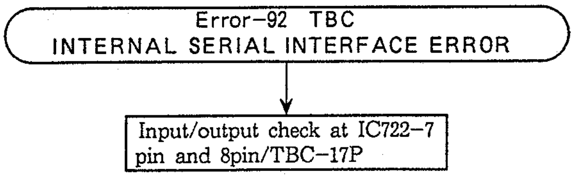

Error−90
KEY INTERFACE ERROR
The pulse is output at TP3/KY-188D when the power is on.
No
Yes
IC107/SS-48DP and IC4/KY-188D check
The pulse is output at TP104/SS-48DP when the power is on.
No
IC101 and IC107/SS-48DP check
Yes
SS-48DP and KY-188D boards connection check

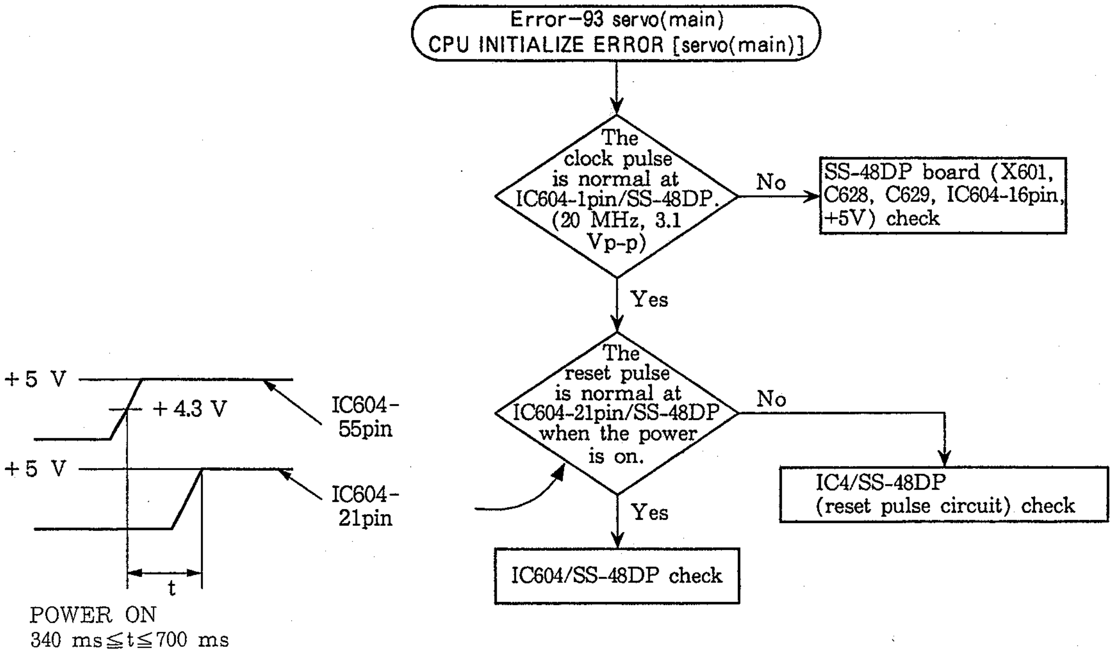

Error−91
1/2VD NOT EXIST
The 1/2 VD signal is input at IC403-18pin /SS-48DP.
No
Yes
SS-48DP board (1/2 VD detect circuit) defect
The VD signal is input at IC405-36pin/ SS-48DP.
No
1/2 VD output system check
Yes
IC403/SS-48DP defect

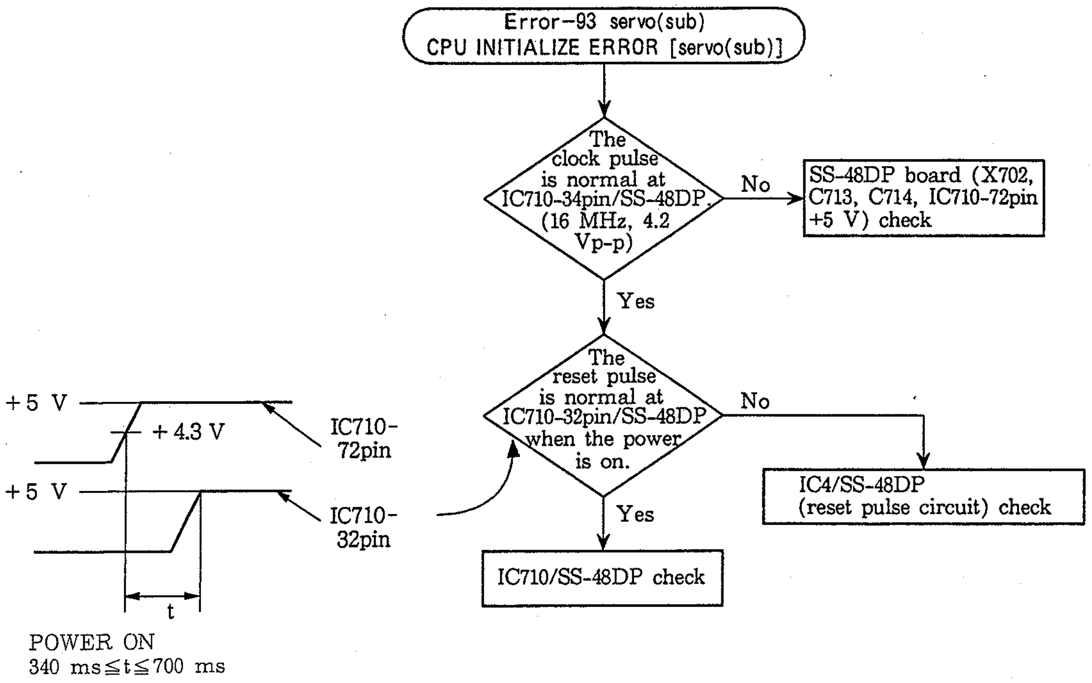

Error−92 SWC−10
INTERNAL SERIAL INTERFACE ERROR
Input/output check at IC2-4pin and 5pin/SWC−10

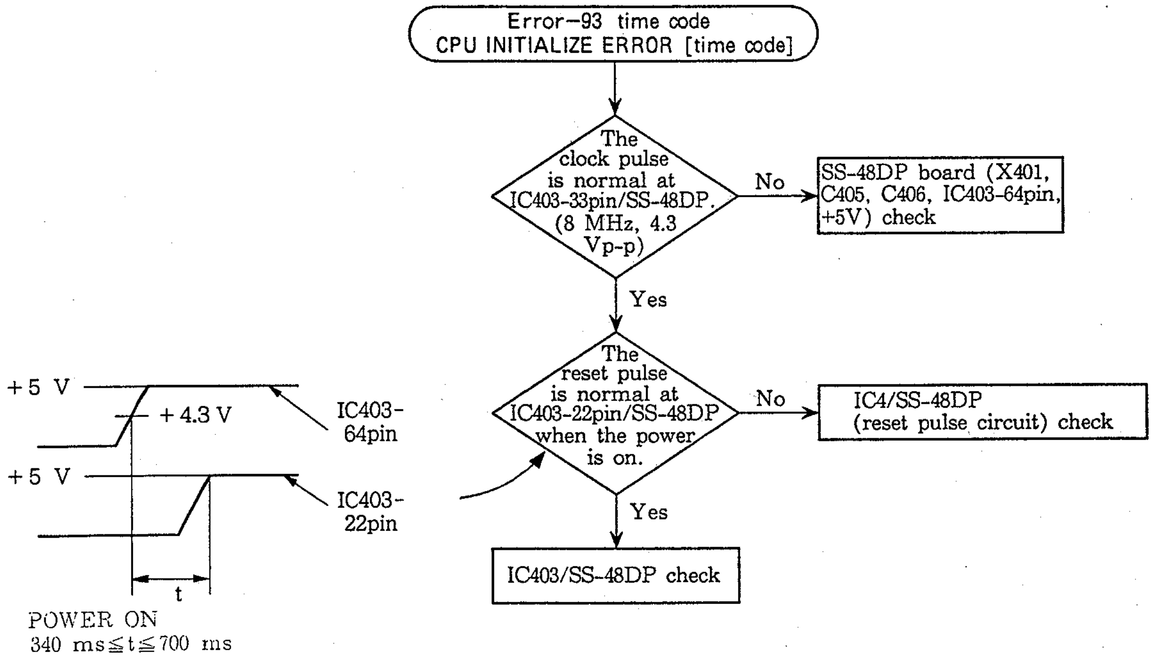

Error−92 SWC−12
INTERNAL SERIAL INTERFACE ERROR
Input/output check at IC1−4pin and 5pin/SWC−12P
IC2−4pin and 5pin/SWC−12P

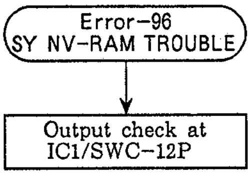

Error−92 MDM
INTERNAL SERIAL INTERFACE ERROR
Input/output check at IC901−52 pin and 51pin/MDM−5P

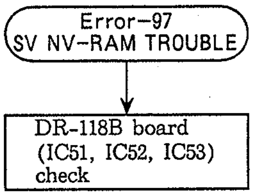

Error−92 TBC
INTERNAL SERIAL INTERFACE ERROR
Input/output check at IC722−7 pin and 8pin/TBC−17P


Error−93 servo(main)
CPU INITIALIZE ERROR [servo(main)]
The clock pulse is normal at IC604-1pin/SS-48DP. (20 MHz, 3.1 Vp-p)
No
SS-48DP board (X601, C628, C629, IC604-16pin, +5V) check
Yes
The reset pulse is normal at IC604-21pin/SS-48DP when the power is on.
No
IC4/SS-48DP (reset pulse circuit) check
Yes
IC604/SS-48DP check
+5 V
+4.3 V
IC604-55pin
+5 V
IC604-21pin
t
POWER ON
340 ms≦t≦700 ms


Error−93 servo(sub)
CPU INITIALIZE ERROR [servo(sub)]
The clock pulse is normal at IC710-34pin/SS-48DP. (16 MHz, 4.2 Vp-p)
No
SS-48DP board (X702, C713, C714, IC710-72pin +5 V) check
Yes
The reset pulse is normal at IC710-32pin/SS-48DP when the power is on.
No
IC4/SS-48DP (reset pulse circuit) check
Yes
IC710/SS-48DP check
+5 V
+4.3 V
IC710-72pin
+5 V
IC710-32pin
t
POWER ON
340 ms≦t≦700 ms


Error–93 time code
CPU INITIALIZE ERROR [time code]
The clock pulse is normal at IC403-33pin/SS-48DP. (8 MHz, 4.3 Vp-p)
No
SS-48DP board (X401, C405, C406, IC403-64pin, +5V) check
Yes
The reset pulse is normal at IC403-22pin/SS-48DP when the power is on.
No
IC4/SS-48DP (reset pulse circuit) check
Yes
IC403/SS-48DP check
+5 V
+4.3 V
IC403-64pin
+5 V
IC403-22pin
t
POWER ON
340 ms≦t≦700 ms


Error–96
SY NV–RAM TROUBLE
Output check at IC1/SWC–12P

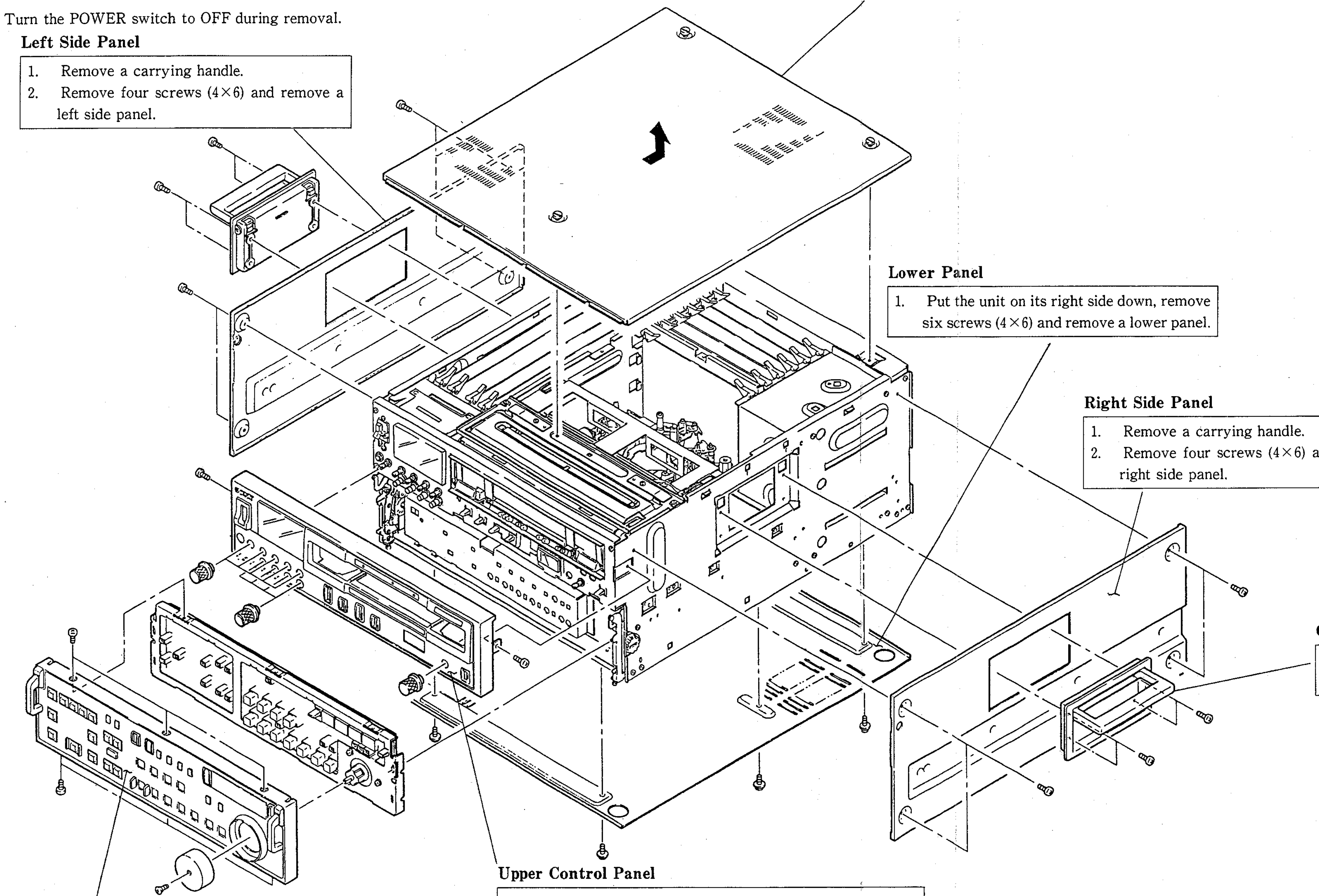

Error–97
SV NV–RAM TROUBLE
DR-118B board (IC51, IC52, IC53) check

2-4. PRINTED CIRCUIT BOARD

SYSTEM	BOARD	CIRCUIT FUNCTION
VIDEO	MDM-5P	Modulator, Demodulator
	NR-41	Limiter
	RP-53P	Video/Audio REC, PB Amplifier
	PA-109	DT Head Amplifier
	TBC-17P	A/D, D/A Memory, W/R Clock Generator
	CP-187	REF Video IN, Monitor OUT
	SWC-11	TBC PROC Control
	DIF-11P	S/P, P/S Converter, 4 : 2 : 2 Decoder/Encoder
	SIF-17	AES/EBU Decoder, Encoder
	DUS-359	Audio Amplifier
	DUS-490	Serial Input Amplifier
AUDIO	CP-175	Audio Input Amplifier
	CP-185	AES/EBU, I/O Buffer, TC Balanced Amplifier
	AFM-8	AFM Audio MOD/DEMOD
	AU-145	Audio Output Amplifier
	AU-146P	Audio PB Process
	AU-147P	Auido REC Process DOLBY-C
	HP-47	Headphones Amplifier
	VR-110	REC Level VR
	VR-111	PB Level VR
	DP-126	Level Meter
	DP-127	Level Meter
	DP-128	Level Meter
	DP-129	Level Meter
	SWC-10	Select Switch, Display
SERVO/ SYSTEM CONTROL	DP-156	RF Meter LED
	VR-119	Tracking Control VR
	SS-48DP	System Control, Drum/Capstan/ Reel Servo
	EQ-42	Time Code Mute
	DT-28	Dynamic Tracking
	DT-29	Dynamic Tracking
	SR-52	Slip Ring
SERVO/ SYSTEM CONTROL	DR-118B	Drum Error Amplifier, Threading Motor Drive, Capstan/Reel Motor Drive, Top/End Sensor
	DD-17	Drum Motor Drive
	TR-73	Tension Regulator Tension Detection
	RM-82	Reel Motor
	DE-15	Reel FG
	PD-56	Pinch Plunger
	DS-31	Dew (Condensation) Sensor
	PTC-42	Reel Table Large/Small Detection
	PTC-43	REC Inhibit
	PTC-49	Threading End Detection
	PTC-54	Loading Motor Pulse Detection
	PTC-55	Casette Data Detection
	CL-25	Cassette Down Detection, Up-Down Motor
	LP-57	Cassette Compartment Lamp
	PC-62	Cassette-in Detection, Large/ Small Cassette Detection
	KY-188D	Keyboard
	KY-205	Keyboard
	KY-206	Keyboard
	DP-136	Time Counter Display
	PTC-39	Search Dial
	PT-9	Power Transistor
	SWC-12P	Hours Meter, Menu Setup
OTHERS	AC-107	Power Supply
	MB-394	Mother Board

2-5. REMOVAL OF CABINET

Turn the POWER switch to OFF during removal.



Left Side Panel

1. Remove a carrying handle.
2. Remove four screws (4×6) and remove a left side panel.

Upper Panel

1. Loosen three fixing screws, and remove an upper panel moving in the direction of the arrow.

Lower Panel

1. Put the unit on its right side down, remove six screws (4×6) and remove a lower panel.

Right Side Panel

1. Remove a carrying handle.
2. Remove four screws (4×6) and remove a right side panel.

Carrying Handle

1. Remove four screws (3×6) and remove a carrying handle.

Upper Control Panel

1. Remove a upper panel.
2. Remove the ten control knobs on a upper control panel.
3. Remove the each one screw (3x6) at the left and right of the upper control panel.
   Insert your fingers in the space between the upper control panel and chassis, and remove the upper control panel as shown in the figure 1.
4. When installing, insert the claws of the upper control panel into the notch of chassis, then fix the panel with the screws as shown in the figure 2.

Lower Control Panel

1. Remove a lower control panel ass'y from the unit. (Refer to Section 2-8.)
2. Remove the each three screws (3×6) at the top and bottom on the lower control panel ass'y.
3. Remove the screw on a search dial (3×5) and remove a dial knob, then remove the lower control panel.

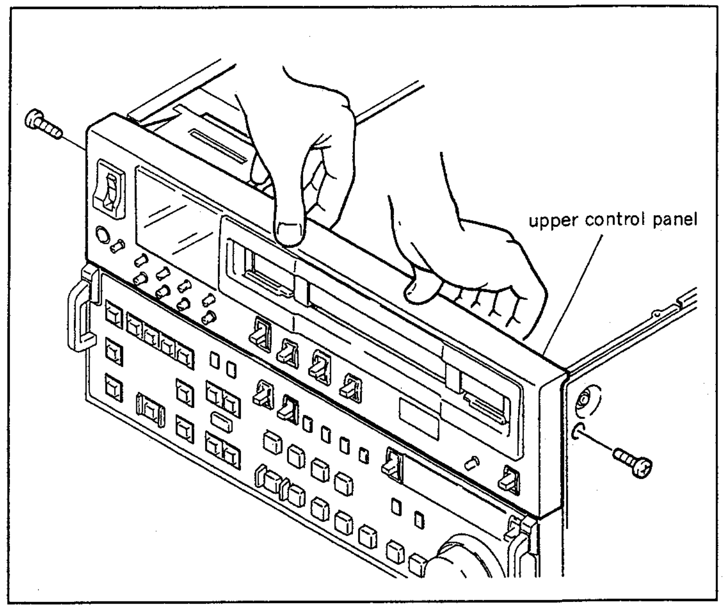


Figure 1

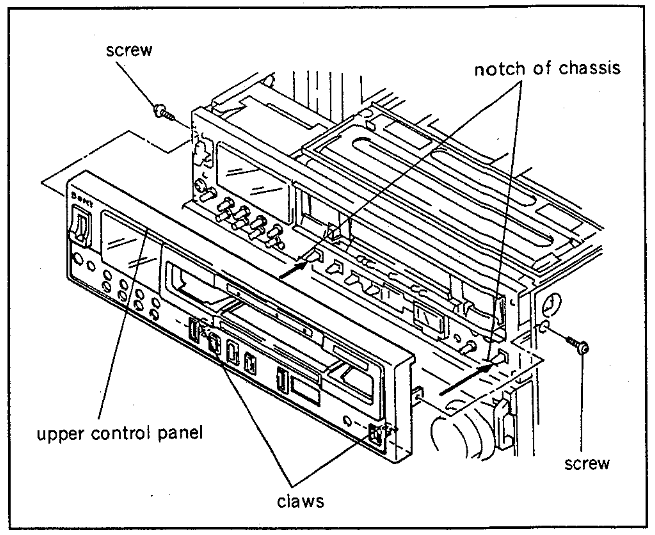
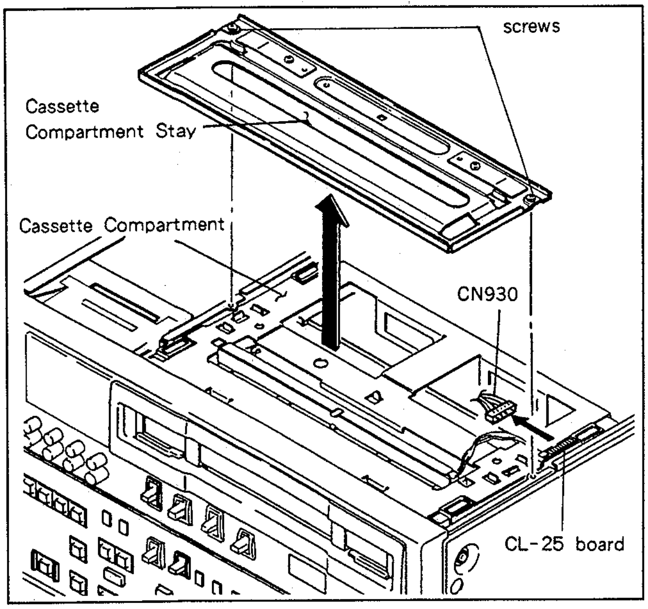


Figure 2

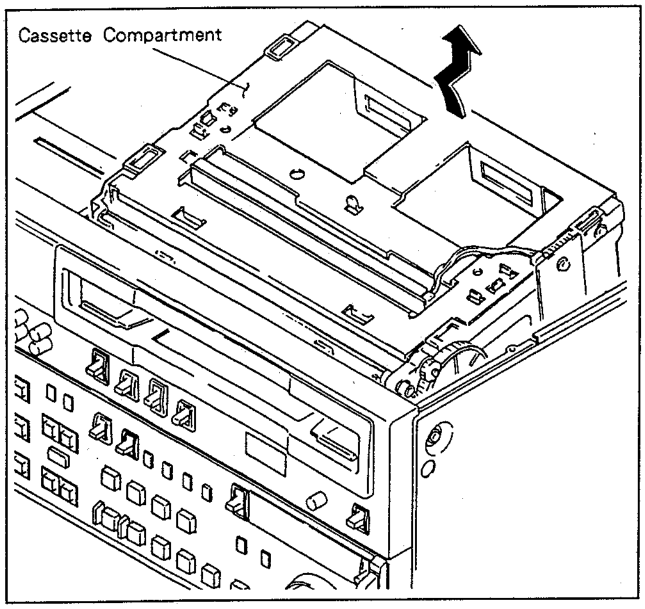
2-6. REMOVAL/INSTALLATION OF CASSETTE COMPARTMENT

• Removal

1. Turn the POWER OFF.
2. Loosen three screws and remove an upper panel. (Refer to Section 2-5.)
3. Loosen the two screws shown in the figure and remove a Cassette Compartment Stay.
   These screws are retained on the Stay, so they don't get out of the Stay.
4. Disconnect the connector CN930 on the CL-25 board at the upper right of the Cassette Compartment.

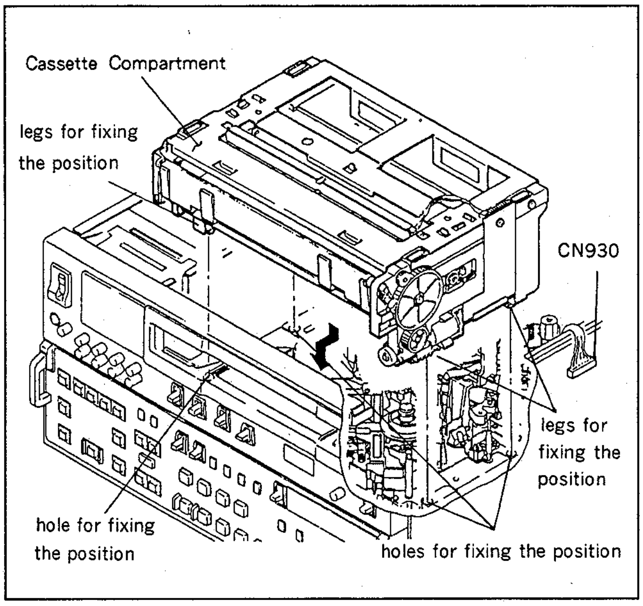

screws
Cassette Compartment Stay
Cassette Compartment
CN930
CL-25 board

5. Slide up the Cassette Compartment raising up the rear part as shown in the figure. Lift up the Cassette Compartment slowly.


Cassette Compartment

• Installation

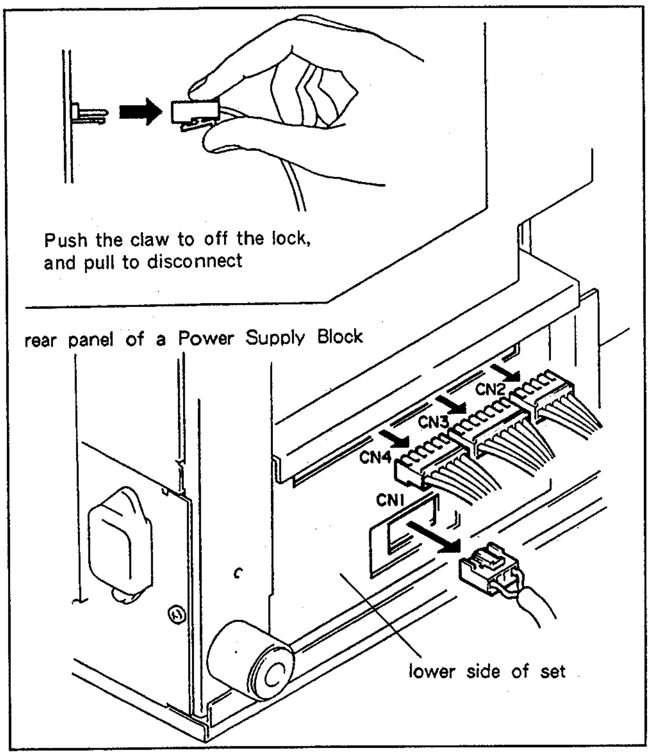
6. Set the harness of the connector(CN930) disconnected in step (4) so it is not put between chassises.
   Install the Cassette Compartment inserting slantingly in the direction as shown in the figure.
   (Note) In this time, confirm that the four legs of the Cassette Compartment for fixing the position are in the holes of the mechanical chassis for fixing the position.


Cassette Compartment
legs for fixing the position
CN930
legs for fixing the position
hole for fixing the position
holes for fixing the position

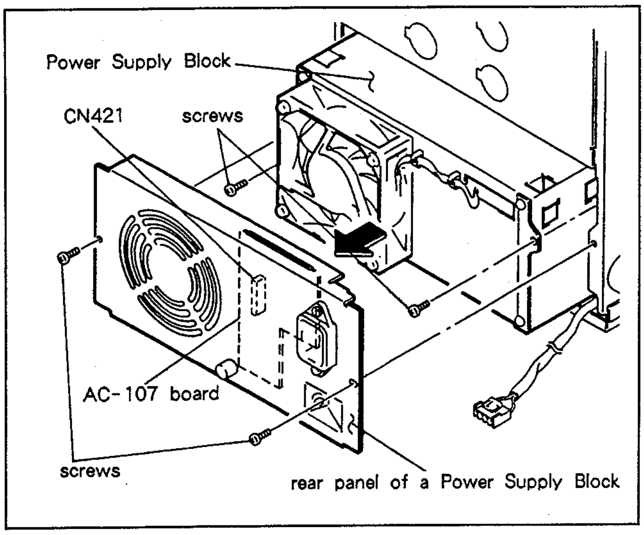
7. After confirming that the Cassette Compartment is fixed to the chassis, install the Cassette Compartment Stay and connect the connector CN930 of the CL-25 board.

2-7. REMOVAL OF POWER SUPPLY BLOCK

1. Turn the POWER OFF.
2. Put the unit on its right side down and remove six screws and remove a lower panel.
3. Disconnect the four connectors(CN1, CN2, CN3, and CN4) shown in the figure.


Push the claw to off the lock,
and pull to disconnect
rear panel of a Power Supply Block
CN2
CN3
CN4
CNI
lower side of set

4. Remove the two screws at the top and bottom on the rear panel of a Power Supply Block and remove the rear panel.

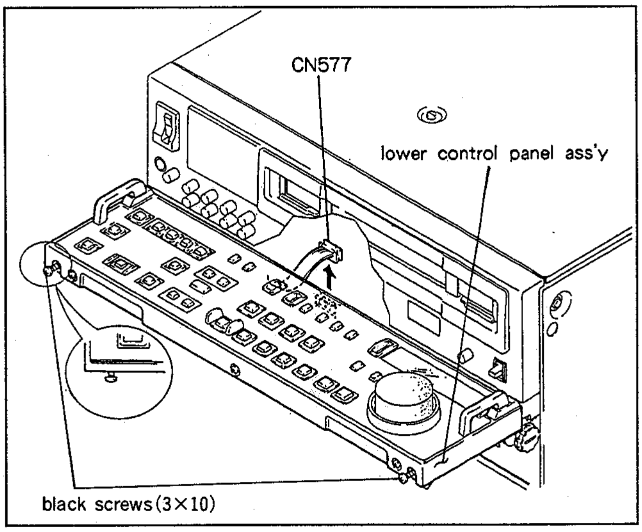

Power Supply Block
CN421
screws
AC-107 board
screws
rear panel of a Power Supply Block

5. Disconnect the connector CN421 on the AC-107 board.
6. Remove the two screws at the top and bottom diagonal and slide the Power Supply Block not to catch the harnesses, and remove the Power Supply Block.

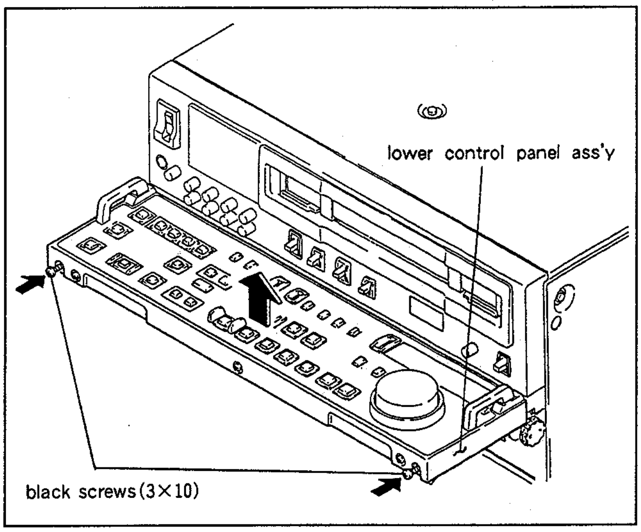
2-8. REMOVAL/INSTALLATION OF LOWER CONTROL PANEL ASS'Y

- **Removal**

1. Fix a lower control panel ass'y at 90 degrees, disconnect the connector CN577 on the SWC-12P board of a sub control panel.
2. Loosen the two black screws (3×10) on the lower control panel ass'y shown in the figure. (Loosen the screws until screw's top are exposed from the notch of the lower control panel ass'y.)

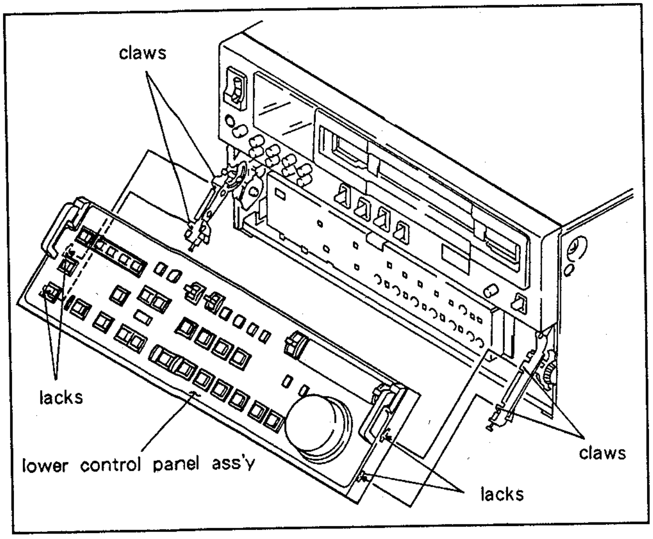

CN577
lower control panel ass'y
black screws(3×10)

3. While pushing the loosen black screws in the direction of the arrow, remove the lower control panel ass'y from arms.


lower control panel ass'y
black screws(3×10)

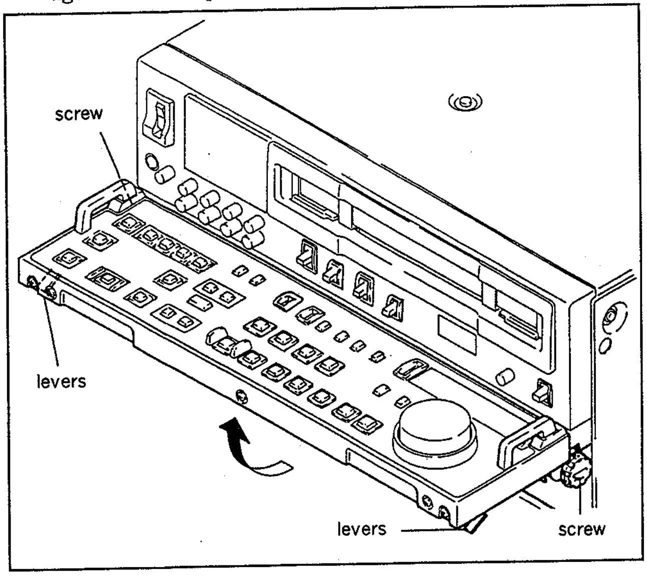
• Installation

4. Connect the harness of the lower control panel ass'y to the connector CN577 on the SWC-12P board of the sub control panel.
5. Fix the arms at 45 degrees, set the lacks of the lower control panel ass'y to the claws of the arms and insert the ass'y until you can hear the click.
   Then fix the ass'y with screws.



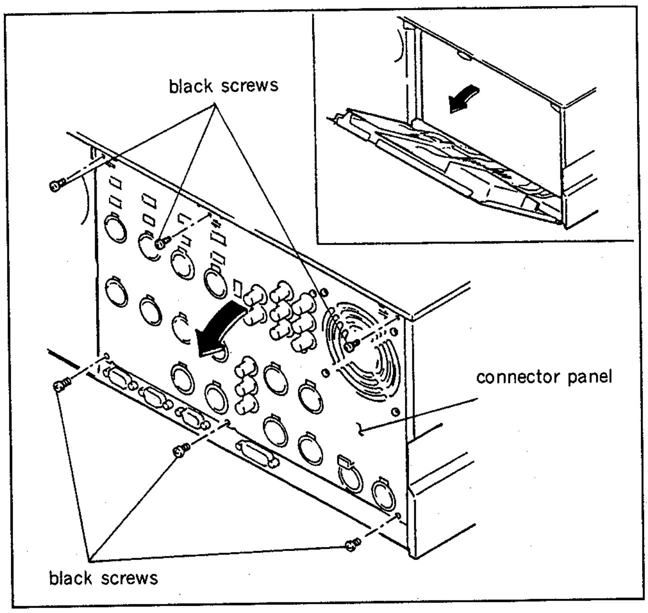
2-9. TILT THE LOWER CONTROL PANEL

1. Raise the panel to the desired angle.
2. While pressing the levers at the right and left sides of the panel, pull the panel up until it stops.
3. Tighten the screws on the right and left sides inside the panel by turning them clockwise.
4. While pressing the levers, lower the panel to the desired angle.
5. In case of change the angle, loosen the screws and try again from step1.



2-10. REMOVAL OF CONNECTOR PANEL

1. Turn the POWER OFF.
2. Remove the six screws indicated ⇨ at the top and bottom on the connector panel, then remove the connector panel not to stretch the harnesses as shown in the figure.



2-11. NOTE FOR CHECK AND MAINTENANCE OF PRINTED CIRCUIT BOARD

Be sure to turn the POWER OFF before removing or inserting the printed circuit boards.

2-12. EXTENSION BOARD

Two extension boards are supplied for check and adjutment of some printed circuit boards.
Insert the extension board into the chassis of a unit and connect the circuit board to be checked or adjusted to the end of the extension board.

Extension board	Connectable Printed Circuit Boards
EX-286 A-6766-389-A	MDM-5P, TBC-17P, SS-48DP, DIF-11P
EX-347 A-6766-390-A	RP-53P, DT-28, AFM-8, AU-145, AU-146P, AU-147P

2-13. NOTES ON REPAIR PARTS

2-13-1. Notes on Repair Parts

(1) Safety Related Components Warning
Components marked with ⚠ on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletins and service manual supplements published by Sony.

(2) Standardization of Parts
Repair parts supplied from Sony Parts Center may not be always identical with the parts which actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts".
This manual's exploded views and electrical spare parts list are indicating the part numbers of "the standardized genuine parts at present".

(3) Change of Parts
Regarding engineering parts changes, refer to Section 17 "CHANGED PARTS".

(4) Stock of Parts
Parts marked with "o" SP (Supply Code) column of the spare parts list are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

(5) Units for Capacitors and Resistors
The following units may be assumed in schematic diagrams, electrical parts list and exploded views unless otherwise specified.
Capacitors : μF
Resistors : Ω

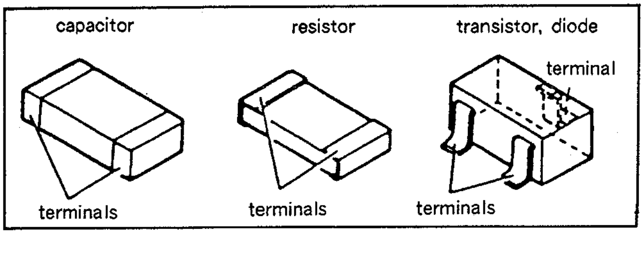
2-13-2. Replacement Procedure for Chip Parts

Required Tools

Soldering iron : 20 W If possible, use a soldering iron tip heat-controller at 270 ± 10 °C.
Braided wire : SOLDER TAUL or equivalent
Sony part No. 7-641-300-81
Solder : 0.6 mm dia. is recommended.
Tweezers

Soldering Conditions

Soldering iron temperature : 270 ± 10 °C.
Soldering time : less than two seconds per a pin.



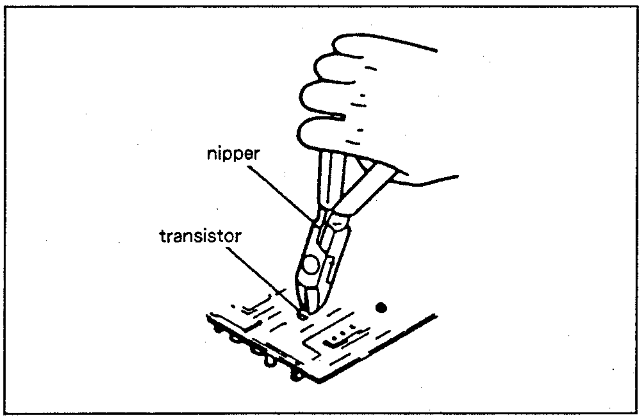
• Resistor and Capacitor Replacement

(1) Place the soldering iron tip onto the chip part and heat it up until the solder is melted. When the solder is melted, slide the chip part aside.
(2) Make sure that there is no pattern peeling, damage and/or bridges around the desoldering positions.
(3) After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
(4) Place new chip part in the desired position and solder both ends.

NOTE: Once a chip part has been removed, never use it again.

• Transistor and Diode Replacement

(1) Cut the terminals of the chip part with a nipper.
(2) Remove the cut leads.
(3) Make sure that there is no pattern peeling, damage and/or bridges around the desoldering positions.
(4) After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
(5) Place new chip part in the desired position and solder the terminals.



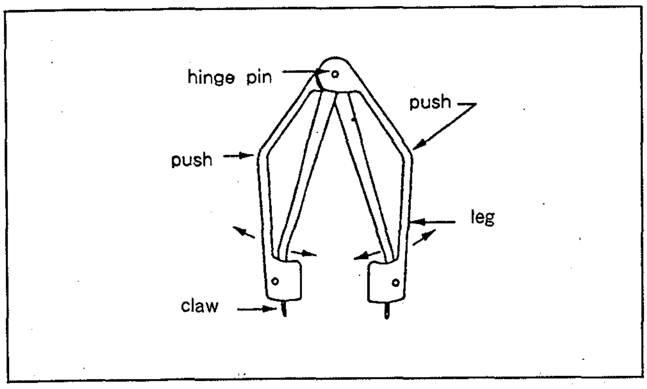
• IC Replacement

(1) Using the braided wire, "SOLDER TAUL" Sony Part No. 7-641-300-81, remove the solder around the pins of the IC-chip to be removed.
(2) While heating up the pins, remove the pins one by one using sharp-pointed tweezers.
(3) Make sure that there is no pattern peeling, damage and/or bridges around the desoldering positions.
(4) After removing the chip part, presolder the area, in which the new chip part is to be placed, with a thin layer of solder.
(5) Place new chip part in the desired position and solder the pins.

2-13-3. Removal of PLCC IC

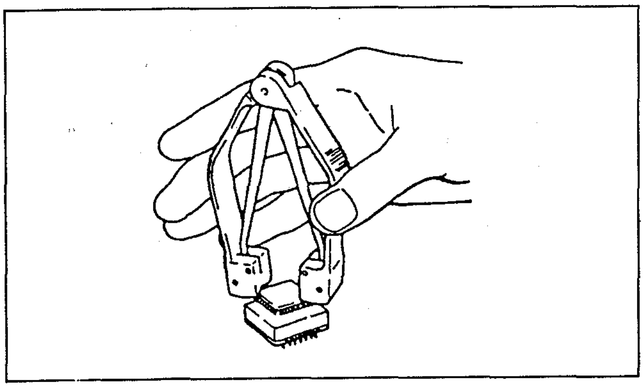
The Extraction Tool is useful for removing the IC (PLCC type) inserted into an IC socket. This is useful for all sizes of ICs of 20 pins through 124 pins.

Extraction Tool (for PLCC socket)
Sony Part No. J-6035-070-A

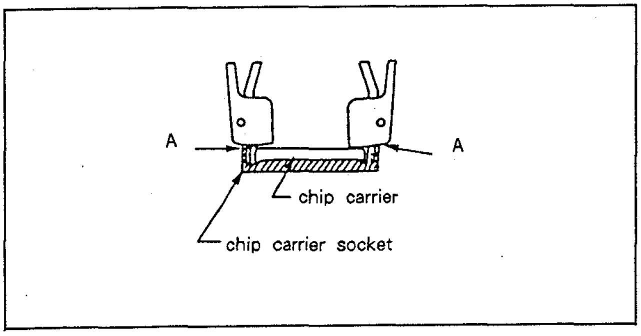

hinge pin
push
push
leg
claw

NOTE : • Never pull chips of IC upward with the Extraction Tool.
• Never hold the Extraction Tool on a strong force.

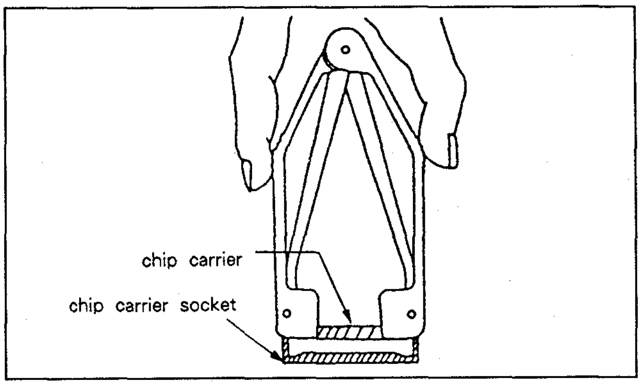
(1) Adjust width so that the claws of the tool are matched to the socket of an IC.



(2) Insert the claws of the tool into the slots of the socket, and then press the tool aginst the socket so that the A portion shown in the figure contact to the socket.


A
A
chip carrier
chip carrier socket

(3) Hold the tool as shown in the figure. The socket is pressed on a little force to downward.


chip carrier
chip carrier socket

(4) Pinch the tool, so the legs of the tool are straightened. At that time, the claws pinch the chips of the IC and pull the IC upward.

(5) After pulling the IC, loosen the force of the fingers, and take off the chip.

2-14. HOW TO OPERATE THE UNIT WITHOUT CASSETTE TAPE

When some mechanical alignments are performed, it may be operated the unit without inserting a cassette tape.
The following procedures are described about the operation of the unit without installing a Cassette Compartment.

1. **Threading**
   Turn the POWER ON.
   After the reel motor and upper drum are rotated, the supply tension arm, take-up tension arm, supply slider, take-up slider and pinch roller slider begin to move, and the unit is put into threading mode.
   The tension arm and three sliders move to the regular positions, and threading is completed.
   It is said that this threading completed state is STOP mode.

2. **Playback**
   Set the setup menu "Item 902" to 1. (At this time, tape protection mode is off.)
   Press the PLAY button in threading completed state. A pinch roller is pressed to the capstan shaft, and the unit is put into PLAY mode.
   If the PLAY button is pressed during the threading, the pinch roller is pressed to a capstan shaft after threading is completed, and the unit is put into PLAY mode.
   NOTE : After adjustment is completed, set the setup menu "Item 902" to 0.

3. **Unthreading**
   Press the EJECT button in threading completed state. A supply slider, take-up slider and pinch roller slider begin to move, and the unit is put into unthreading mode.
   Three sliders move to the regular positions, and unthreading is completed.

4. **Search**
   Set the setup menu "Item 902" to 1. (At this time, tape protection mode is off.)
   Rotate a search dial to forward or reverse direction in threading completed state. A pinch roller is pressed to a capstan shaft, and the unit is put into search mode in the direction and the speed decided by the search dial.
   If setup menu "Item 101" is set to 1, press the SEARCH button and rotate the search dial in threading completed state. Then the unit is put into search mode.
   NOTE : After adjustment is completed, set the setup menu "Item 902" to 0.

5. **Fast forward and rewind**
   Set the setup menu "Item 902" to 1. (At this time, tape protection mode is off.)
   Press the F.FWD button or REW button in threading completed state. Then the unit is put into fast foward or rewind mode.
   NOTE : After adjustment is completed, set the setup menu "Item 902" to 0.

6. **Recording**
   Set the setup menu "Item 902" to 1. (At this time, tape protection mode is off.)

   - **A small cassette**
     Press the PLAY and REC buttons while pressing the Miss-REC switch for small cassette on the left side of a supply reel table in threading completed state.
     Then the unit is put into REC mode.
     When the Miss-REC switch is released, the unit is not in REC mode.

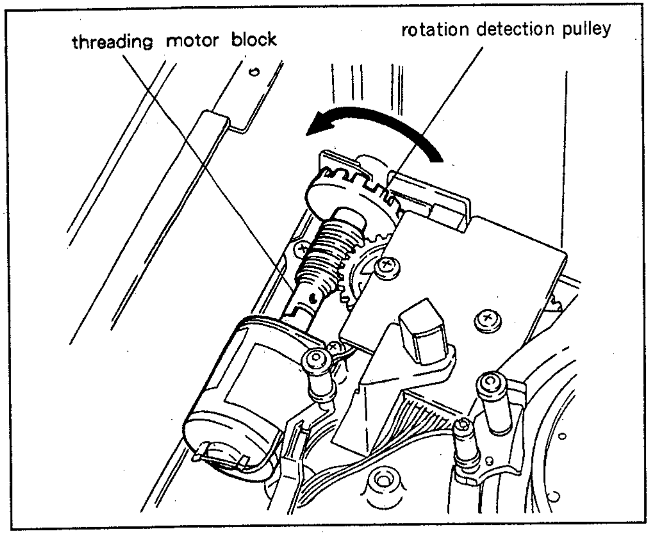
   - **A large Cassette**
     Press the PLAY and REC buttons while pressing the Miss-REC switch for large cassette on the right side of a take-up reel table in threading completed state.
     Then the unit is put into REC mode.
     When the Miss-REC switch is released, the unit is not in REC mode.

   NOTE : After adjustment is completed, set the setup menu "Item 902" to 0.

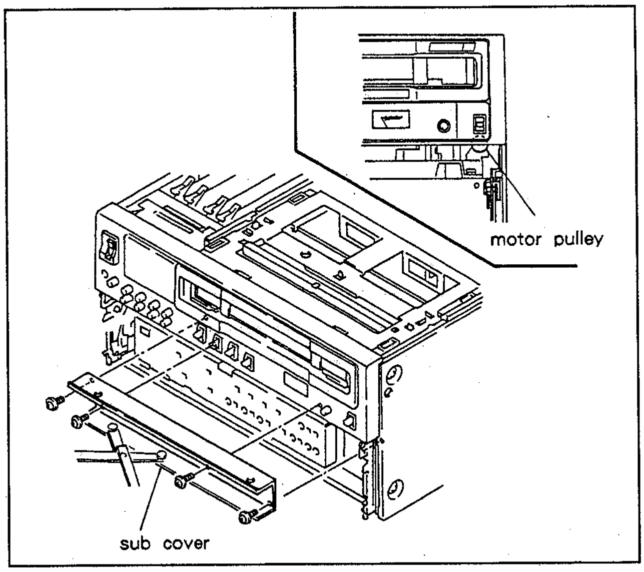
2-15. TAKE OUT THE CASSETTE TAPE IN SLACKING

When the tape in the unit is slacked, take out the cassette tape by the following procedures carefully so that the tape is not damaged.

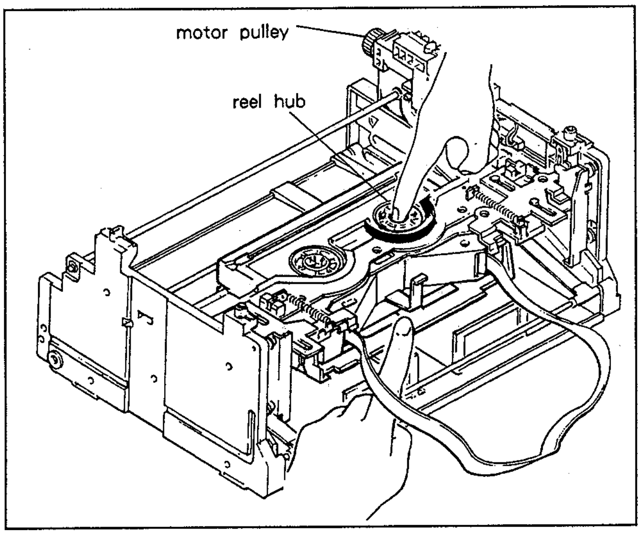
1. Turn the POWER OFF.
2. Remove the upper panel. (Refer to Section 2-5.)
3. Turn the rotation detection pulley of a Threading Motor Block counterclockwise until the supply tension arm, take-up tension arm, supply slider, take-up slider and pinch roller slider are threading completed state.



4. Remove the Cassette Compartment Stay. (Refer to Section 2-6.)
5. Disconnect the connector CN930 on the CL-25 board of the Cassette Compartment. (Refer to Section 2-6.)
6. Remove the lower control panel ass'y. (Refer to Section 2-8.)
7. Remove the sub cover.
8. Turn the motor pulley shown in the figure in the direction of the arrow.



9. While holding a cassette lid by hand to prevent it closing so that the cassette compartment moves up. (Stop rotating the pulley just before the cassette compartment begin to moves to the surface.)
10. Take out the cassette compartment slowly from the unit while holding the cassette lid.
11. Wind the tape into the cassette by turning a reel hub with a finger and close the cassette lid.



12. Remove the cassette tape from the cassette compartment.
13. Turn the pulley described in Step 8 so that the stage of the cassette compartment moves the cassette out position.
14. Install the cassette compartment to the unit.
15. Connect the connector (CN930), then install the Cassette Compartment Stay.

NOTE : Locate the cause of the trouble and remedy the problem, before the POWER switch is turned ON.

2-16. CLEANING WHEN HEADS CLOGGED

If the video head is clogged, clean the head as the following procedures.

• Cleaning by cleaning tape

1. Insert the cleaning tape BCT-5CLN in the unit, and press the PLAY button at once.

   NOTE : • Make sure to use the cleaning tape BCT-5CLN. If the cleaning is performed by other cleaning tape, not the BCT-5CLN, unusual friction or damage of the video head may occurred.

   • Press the PLAY button immediately after inserting the cleaning tape BCT-5CLN in the unit.

2. After using the cleaning tape in play mode for 5 seconds, press the EJECT button.

   NOTE : • Make sure to press the EJECT button not STOP button.

   • Do not put the unit in play mode more than 5 seconds.

   • Do not use the cleaning tape with rewind.

3. Confirm that the head clog is clear.

   If the video head is clogged after Step 2, clean the video head as following procedure.

• Cleaning by cleaning piece

1. Hold the cleaning piece moistened with cleaning fluid against the heads gently.
2. Slowly rotate the upper drum in the direction of head's rotation with a finger and clean the video head.

   NOTE : • Do not move the cleaning piece in a vertical direction. This will damage the video head.

   • Be sure to turn the POWER ON, when cleaning is performed.

2-17. REPLACEMENT OF BOARDS

2-17-1. SWC-10 Board

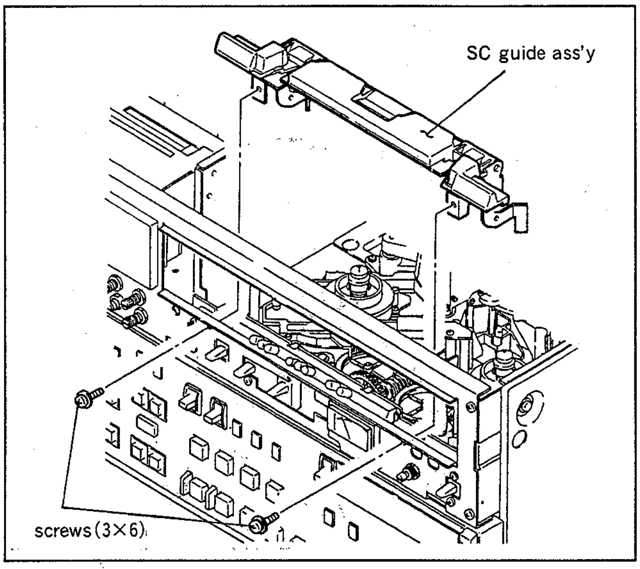
(1) Turn the POWER OFF.

(2) Loosen three screws and remove an upper panel. (Refer to Section 2-5.)

(3) Remove ten control knobs and two screws and remove an upper control panel. (Refer to Section 2-5.)

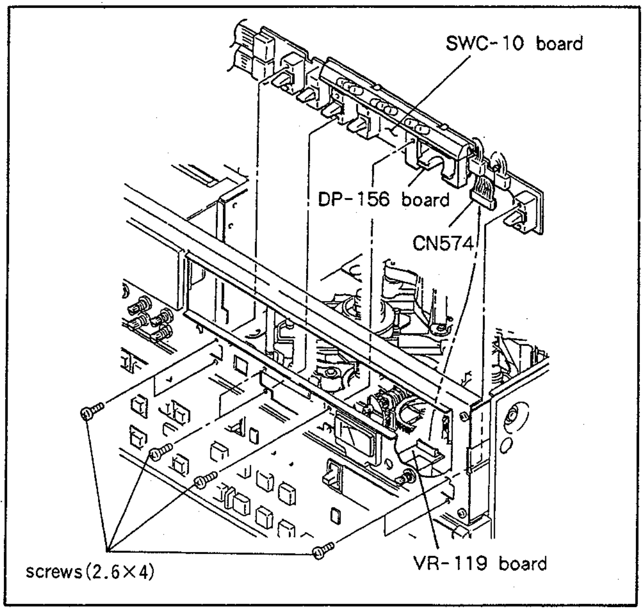
(4) Remove a Cassette Compartment. (Refer to Section 2-6.)

(5) Remove the two screws (3×6) shown in the figure and remove a SC guide ass'y.

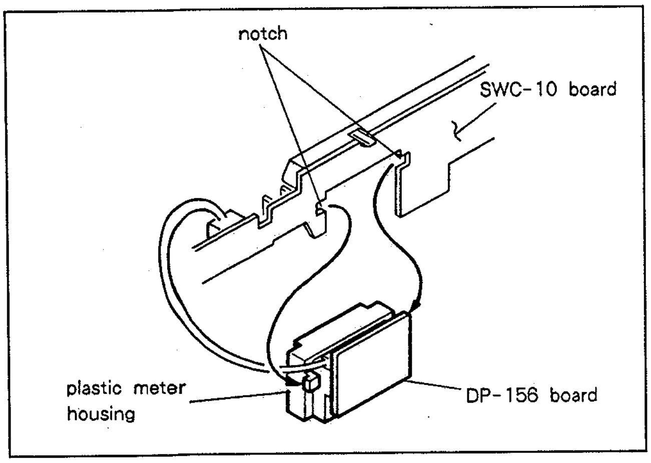


(6) Disconnect the connector(CN574) of the VR-119 board while holding the board.

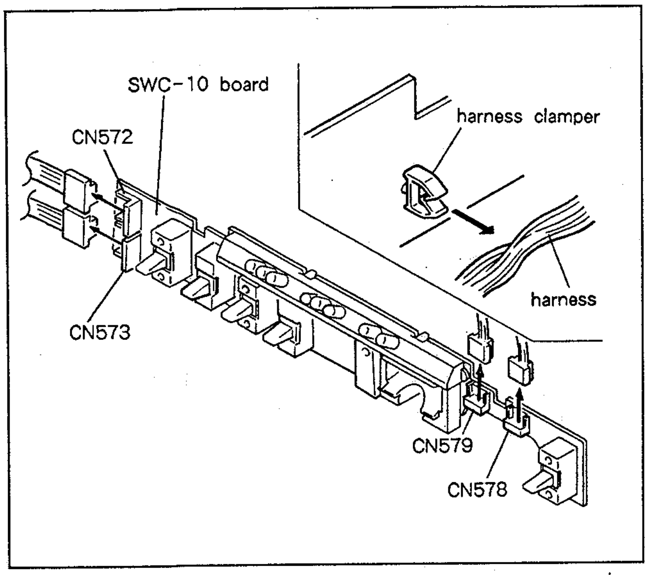
(7) Remove the seven screws (2.6×4) shown in the figure and remove the SWC-10/DP-156 boards.



(8) Pull off the plastic meter housing of the DP-156 board from the notch of the SWC-10 board.


notch
SWC-10 board
plastic meter housing
DP-156 board

(9) Disconnect the four connectors(CN572, CN573, CN578 and CN579) of the SWC-10 board.


SWC-10 board
CN572
harness clamper
harness
CN573
CN579
CN578

(10) Remove the harness from the clamper and remove the SWC-10 board.

2-17-2. VR-119 Board

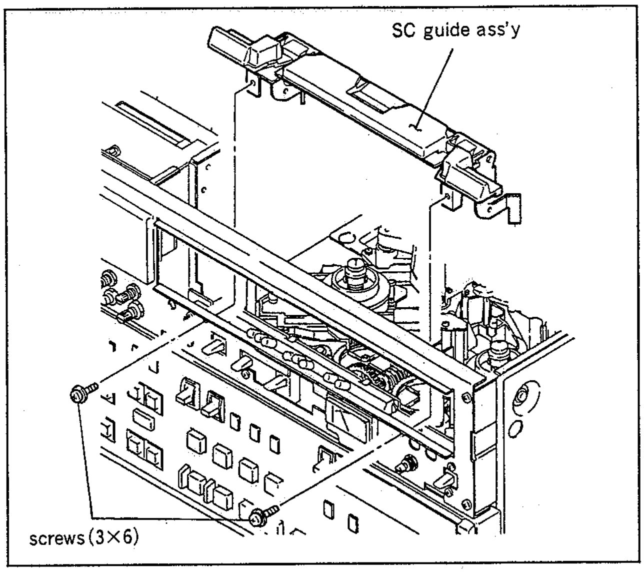
(1) Turn the POWER OFF.

(2) Loosen three screws and remove an upper panel. (Refer to Section 2-5.)

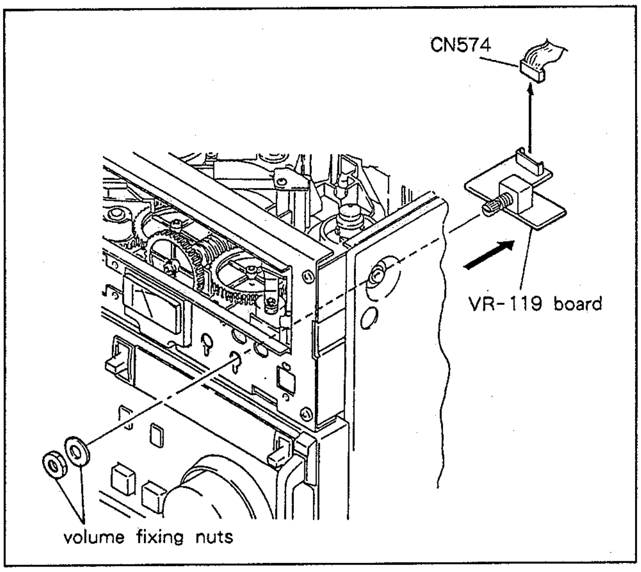
(3) Remove ten control knobs and two screws and remove an upper control panel. (Refer to Section 2-5.)

(4) Remove a Cassette Compartment. (Refer to Section 2-6.)

(5) Remove the two screws (3×6) shown in the figure and remove a SC guide ass'y.


SC guide ass'y
screws (3×6)

(6) Disconnect the connector (CN574) of the VR-119 board while holding the board.


CN574
VR-119 board
volume fixing nuts

(7) Remove two volume fixing nuts from the control panel side and remove the VR-119 board.

2-17-3. DP-126/127/128/129 Boards

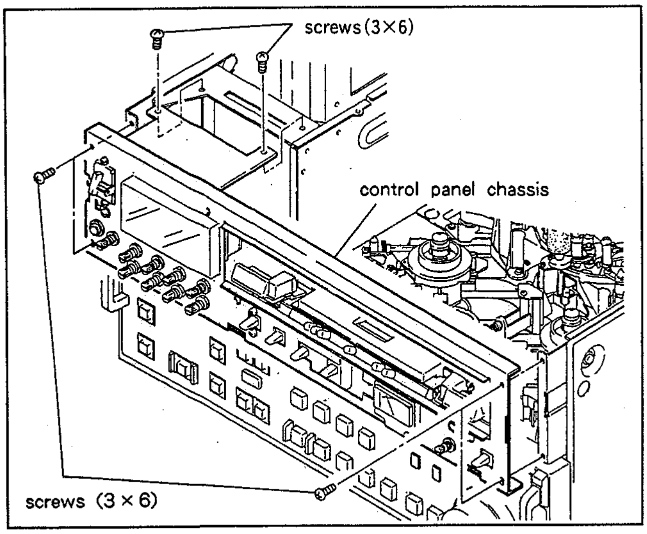
• Removal

(1) Turn the POWER OFF.

(2) Loosen three screws and remove an upper panel. (Refer to Section 2-5.)

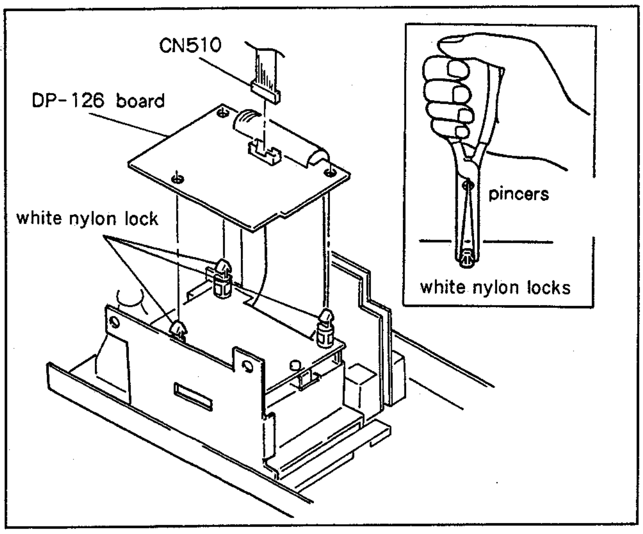
(3) Remove ten control knobs and two screws and remove an upper control panel. (Refer to Section 2-5.)

(4) Remove the six screws (3×6) shown in the figure and remove the control panel chassis.

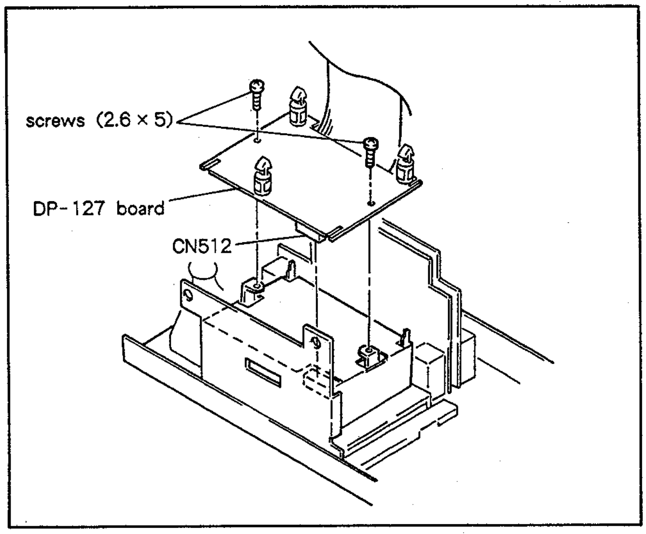

screws(3×6)
control panel chassis
screws (3 × 6)

(5) Disconnect the connector (CN510) of the DP-126 board.

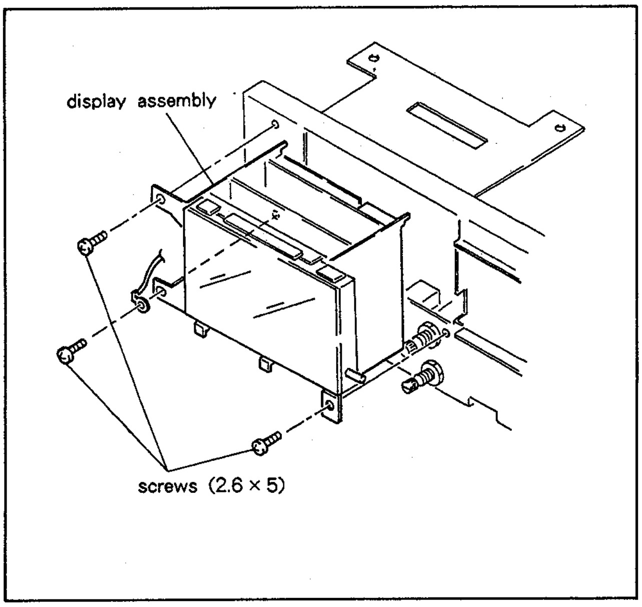
(6) Push and remove the white nylon locks fixing the DP-126 board with a pincers from the board.


CN510
DP-126 board
white nylon lock
pincers
white nylon locks

(7) Remove the two screws (2.6×5) shown in the figure and disconnect the connector (CN512) on the DP-127 board which is connected with DP-128 board, and lift up the DP-127 board to remove.

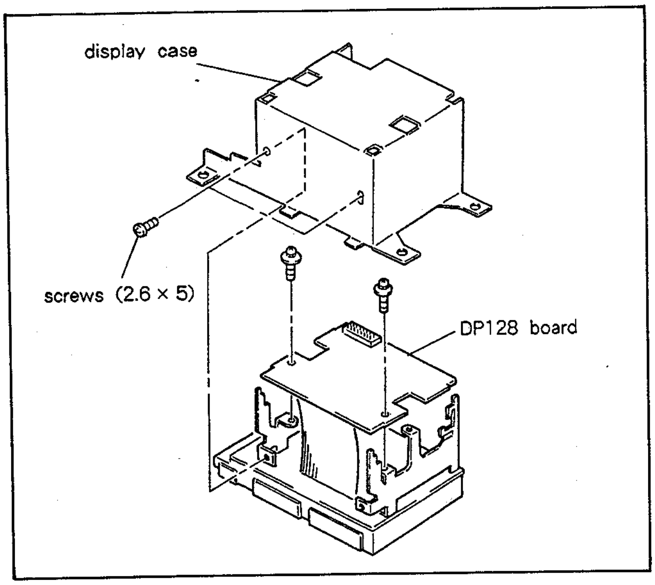

screws (2.6 × 5)
DP-127 board
CN512

(8) Remove three screws (2.6×5) shown in the figure, and remove the display assembly.


display assembly
screws (2.6 × 5)

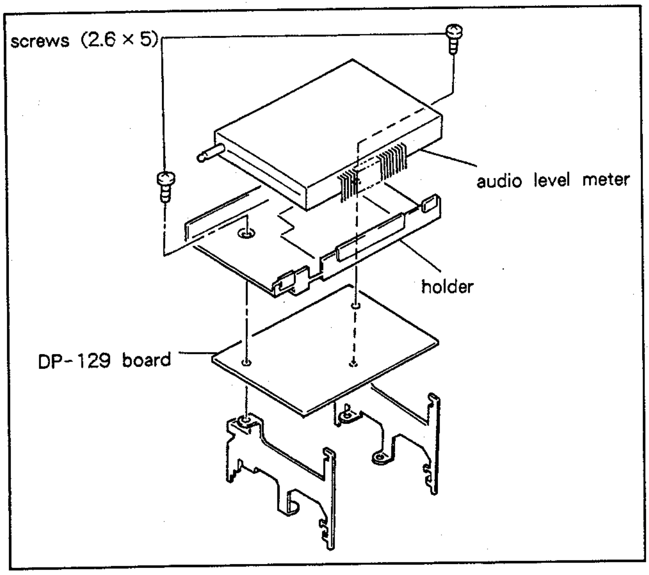
(9) Remove the two screws (2.6×5) shown in the figure, and remove the display case.

(10) Remove the two screws (2.6×5) shown in the figure, and remove the DP-128 board.


display case
screws (2.6 × 5)
DP128 board

(11) Push the claws of the holder for audio level meter to outside, and remove the audio level meter.

(12) Remove the two screws (2.6×5) shown in the figure, and remove the DP-129 board.


screws (2.6 × 5)
audio level meter
holder
DP-129 board

2-17-4. HP-47 Board

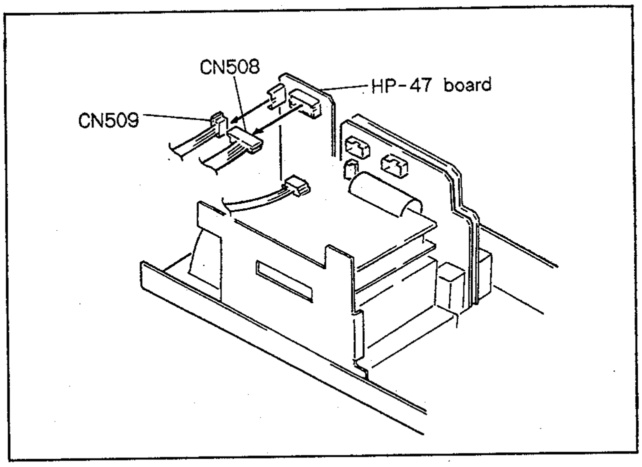
(1) Turn the POWER OFF.

(2) Loosen three screws and remove an upper panel. (Refer to Section 2-5.)

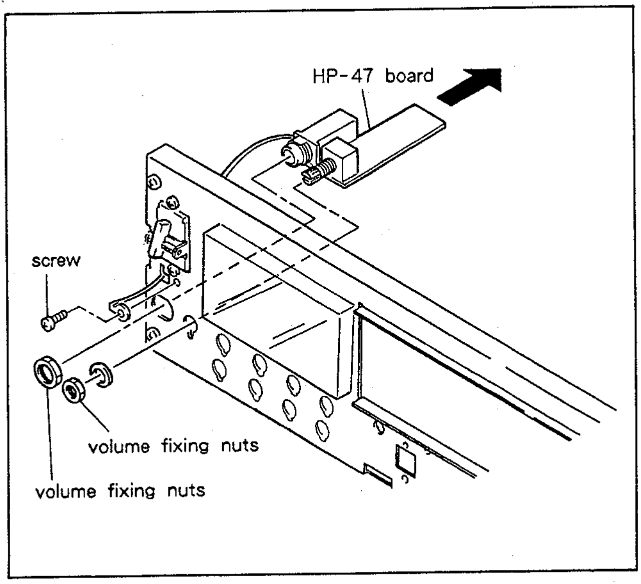
(3) Remove ten control knobs and two screws and remove an upper control panel. (Refer to Section 2-5.)

(4) Remove the six screws, and remove the control panel chassis. (Refer to Section 2-17-3.)

(5) Disconnect the two connectors (CN508 and CN509) on the HP-47 board.

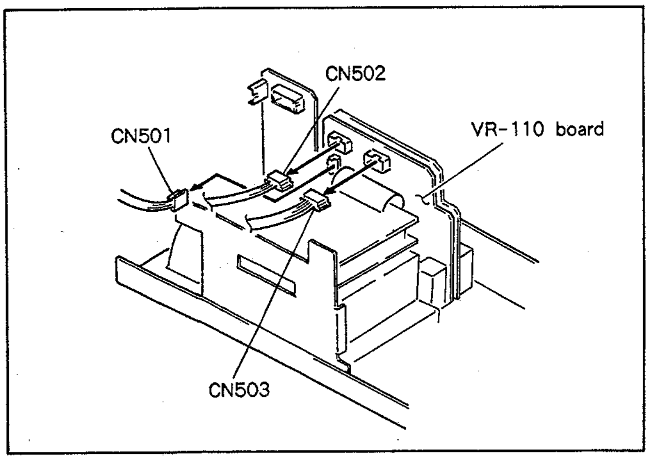

CN508
HP-47 board
CN509

(6) Remove a screw and the two volume fixing nuts from the control panel side, and remove the HP-47 board.

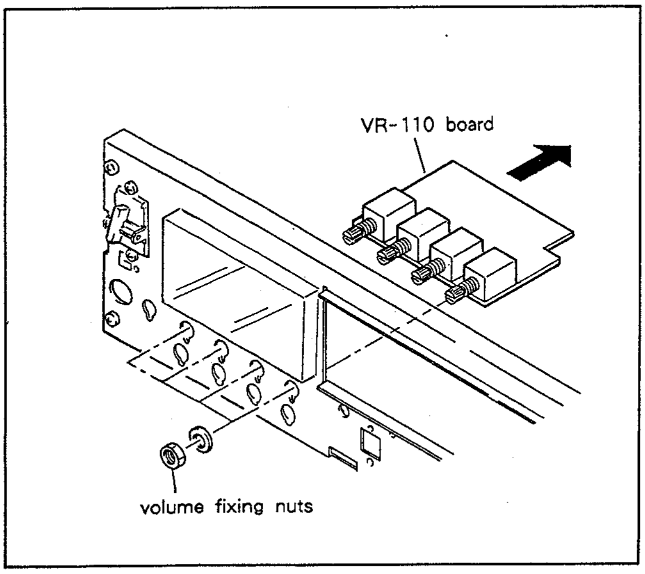

HP-47 board
screw
volume fixing nuts
volume fixing nuts

2-17-5. VR-110 Board

(1) Turn the POWER OFF.
(2) Loosen three screws and remove an upper panel. (Refer to Section 2-5.)
(3) Remove ten control knobs and two screws and remove an upper control panel. (Refer to Section 2-5.)
(4) Remove six screws and remove the control panel chassis. (Refer to Section 2-17-3.)
(5) Disconnect the three connectors (CN501, CN502, and CN503) of the VR-110 board.

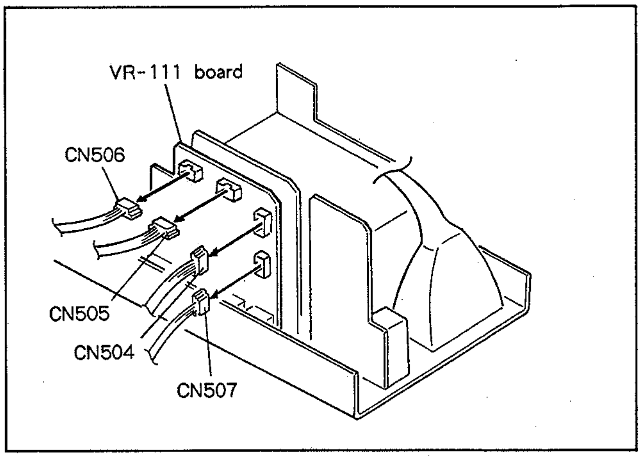

CN502
CN501
VR-110 board
CN503

(6) Remove four volume fixing nuts from the control panel side and remove the VR-110 board.

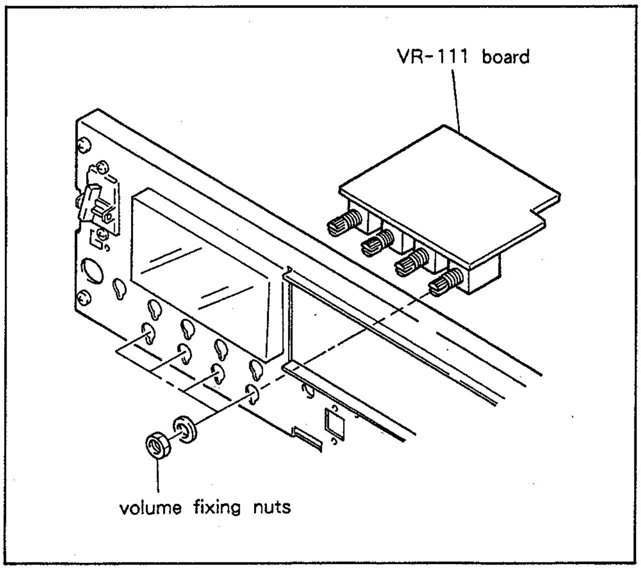

VR-110 board
volume fixing nuts

2-17-6. VR-111 Board

(1) Turn the POWER OFF.
(2) Loosen three screws and remove an upper panel. (Refer to Section 2-5.)
(3) Remove ten control knobs and two screws and remove an upper control panel. (Refer to Section 2-5.)
(4) Remove six screws and remove the control panel chassis. (Refer to Section 2-17-3.)
(5) Disconnect four connectors (CN504, CN505, CN506 and CN507) of the VR-111 board.

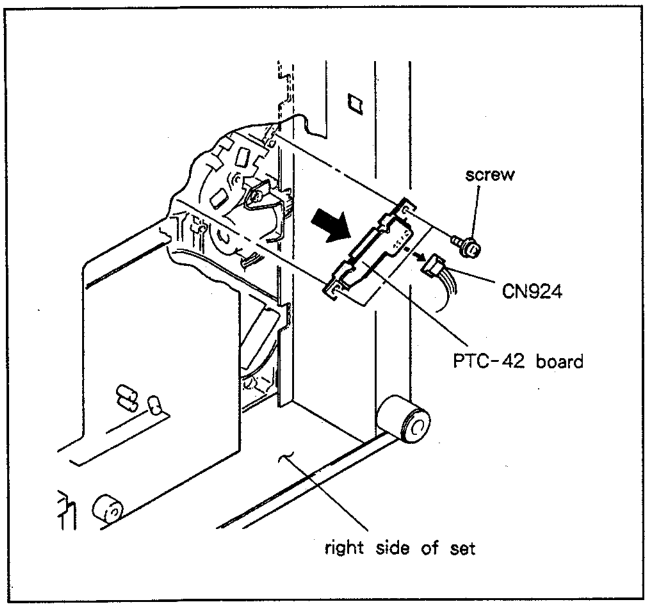

VR-111 board
CN506
CN505
CN504
CN507

(6) Remove four fixing nuts from the control panel and remove the VR-111 board.


VR-111 board
volume fixing nuts

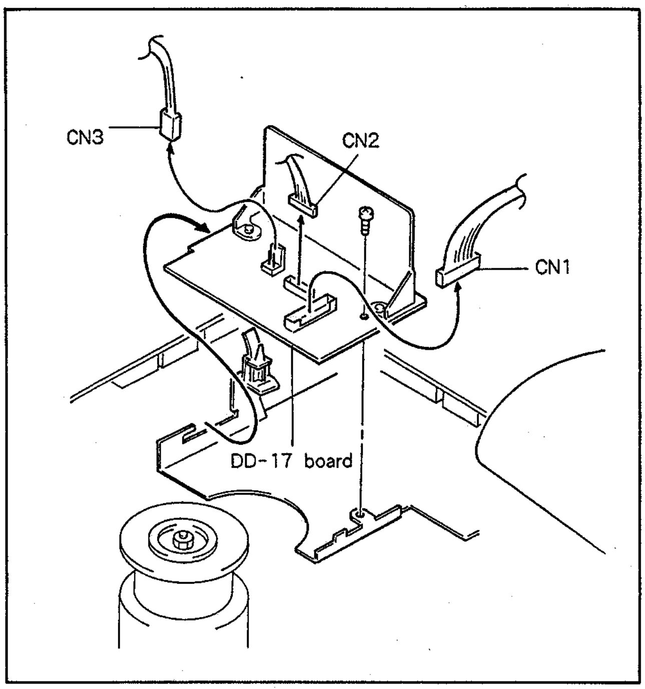
2-17-7. PTC-42 Board

(1) Turn the POWER OFF.
(2) Put the unit right side down and remove six screws and remove a lower panel.
(3) Unhook the PCB holders holding the DR-118B board, and open the DR-118B board.
(4) Remove two screws and remove the PTC-42 board.
(5) Disconnect the connector CN924.



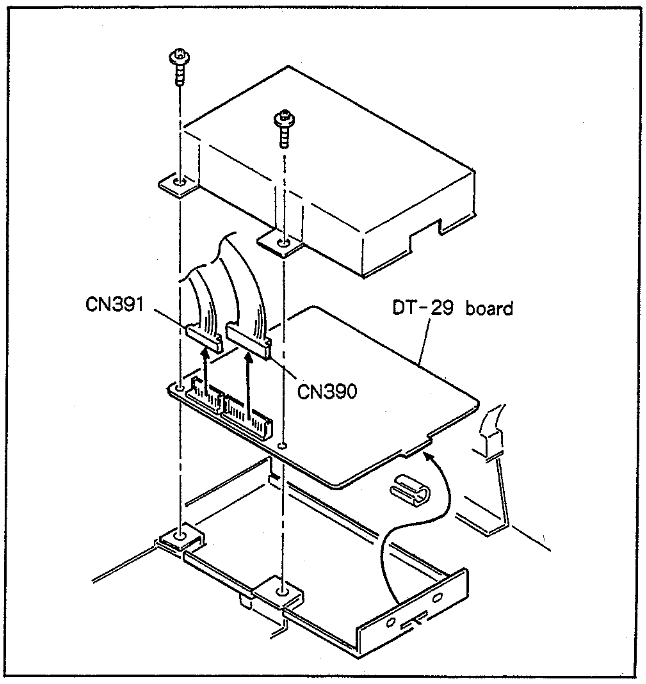
2-17-8. DD-17 Board

(1) Turn the POWER OFF.
(2) Put the unit right side down and remove six screws, and remove a lower panel.
(3) Unhook the PCB holders holding the DR-118B board, and open the DR-118B board.
(4) Disconnect three connectors (CN1, CN2 and CN3) of the DD-17 board.
(5) Remove a screw and remove the DD-17 board.



2-17-9. DT-29 Board

(1) Turn the POWER OFF.
(2) Put the unit right side down and remove six screws, and remove a lower panel.
(3) Unhook the PCB holders holding the DR-118B board, and open the DR-118B board.
(4) Disconnect two connectors (CN390 and CN391) of the DT-29 board.
(5) Remove two screws and remove the DT-29 board.

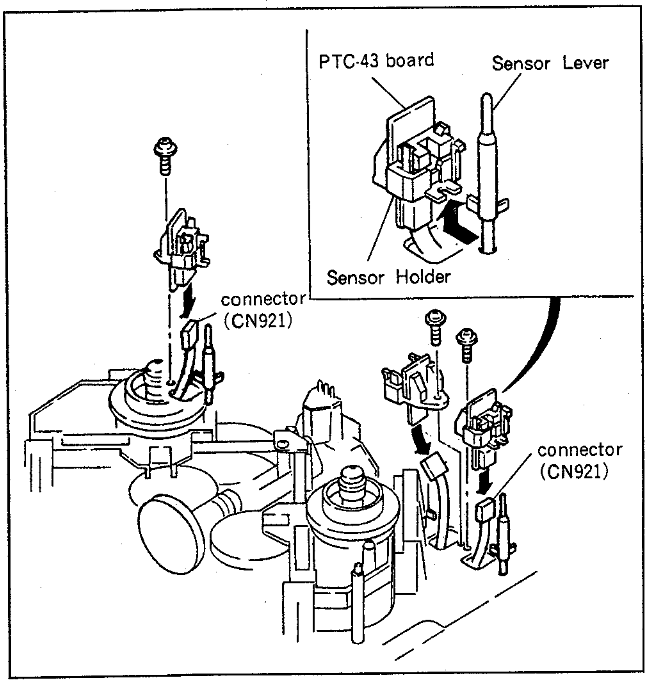


2-18. REMOVAL/INSTALLATION OF DETECTION SWITCH

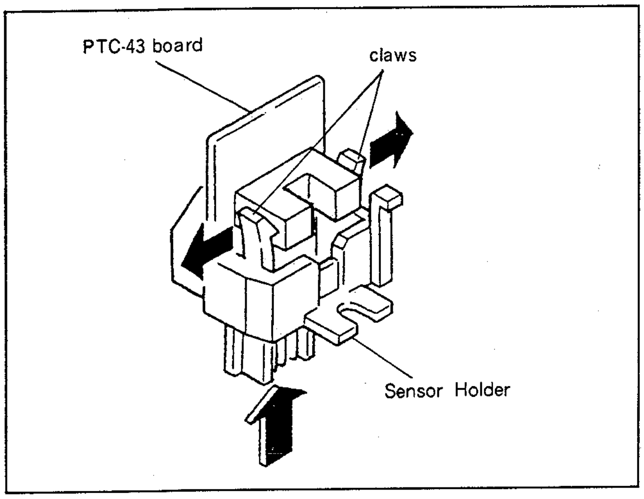
2-18-1. Removal/Installation of MR Sensor

• Removal

1. Remove the Cassette Compartment. (Refer to Section 2-6.)
2. Remove the screws shown in the figure.
3. Slide up the Sensor Holder in the direction of the arrow.
   NOTE : The Sensor Lever and spring may be removed at the same time.
   Take care of them not to lost.
4. Disconnect the connector CN921 on the PTC-43 board.

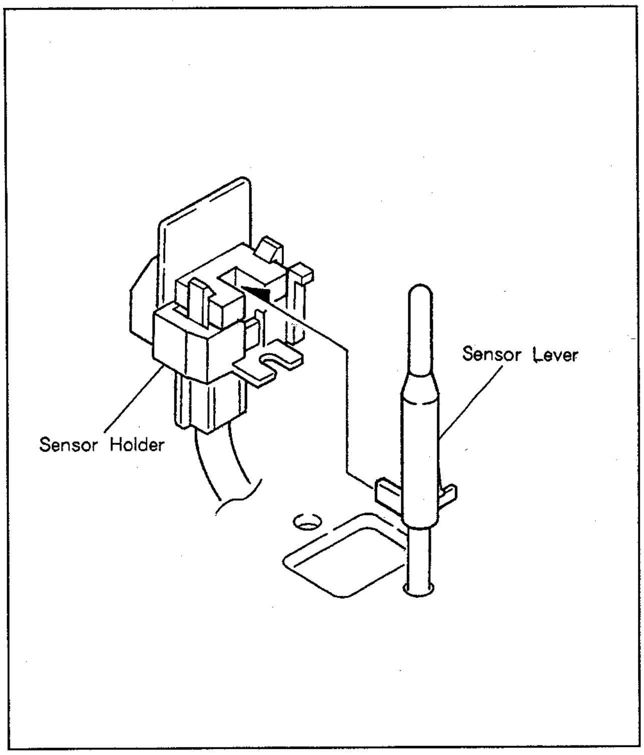

PTC-43 board
Sensor Lever
Sensor Holder
connector
(CN921)
connector
(CN921)

5. Remove the PTC-43 board during extending the claws as shown in the figure.


PTC-43 board
claws
Sensor Holder

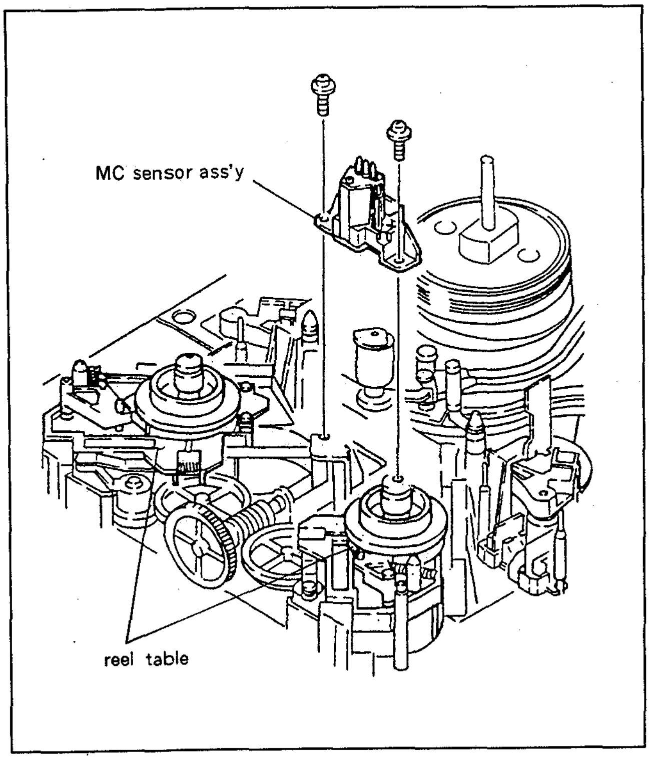
• Installation

6. Install the sensor of the PTC-43 board to the Sensor Holder.
7. Install the Sensor Holder to the mechanical chassis.
   NOTE : Install the large projection of the Sensor Lever to the lack of the Sensor Holder.

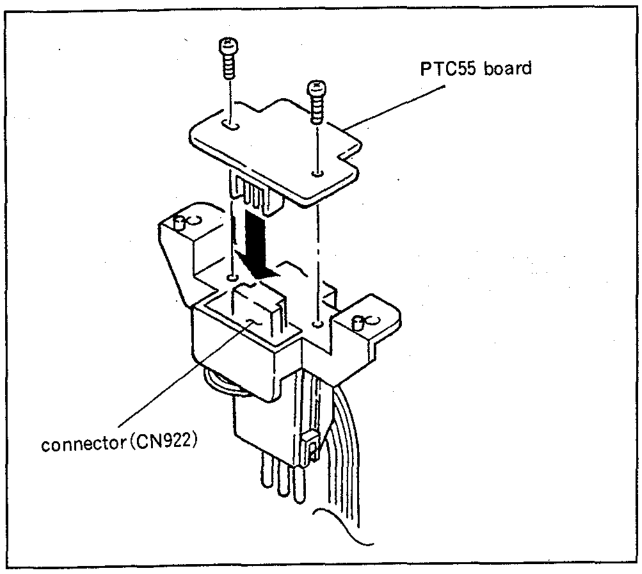

Sensor Lever
Sensor Holder

2-18-2. Removal of MC Sensor

1. Remove the Cassette Compartment. (Refer to Section 2-6.)
2. Position the reel table at the center or large cassette position.
3. Remove the two screws shown in the figure and remove the MC sensor ass'y.



4. Remove the two screws from the reverse side of the MC sensor ass'y and remove the PTC-55 board.
5. Disconnect the connector CN922 on the PTC-55 board.



2-19. PRECAUTION IN REPLACEMENT OF DR-118B BOARD

NOVRAM CXK1013P (IC51, IC52 and IC53) are mounted on the DR-118B board to save the data of servo system adjustment.

When the DR-118B board is replaced, pull out the NOVRAM (IC51, IC52 and IC53) and mount them on the new DR-118B board.

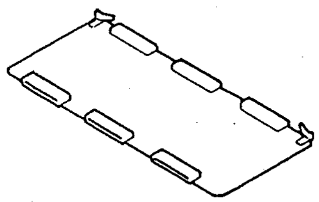
If not mounting them to the new board, servo system may not be operated normally.

NOTE : The IC51, 52 and 53 are not mounted on the boards which are in stock as service parts.

2-20. FIXTURE

Fig. No	Part No.	Description	For Use
1	A-6766-389-A	Extention Board (L), EX-286	MDM-5, DIF-11, TBC-17, SS-48D Board extention
2	A-6766-390-A	Exteusion Board (S), EX-347	AU-145, AU-146, AU-147, AFM-8, DT-28 RP-53 Board extension
3	J-6001-820-A	Drum Eccentricity Gauge (3)	Upper drum eccentricity adjustment
4	J-6001-830-A	Drum Eccentricity Gauge (2)	
5	J-6001-840-A	Drum Eccentricity Gauge (1)	
6	J-6035-070-A	Extraction Tool (for PLCC socket)	Extraction of IC (PLCC type)
7	J-6080-008-A	Cassette Reference Plate	Reel table height adjustment
8	J-6080-011-A	Reel Table Tension Gauge	Brake torque adjustment
9	J-6080-029-A	Adjustment Mirror	
10	J-6080-840-A	Adjustment Mirror	Tape path adjustment
11	J-6086-570-A	Reference Flat Plate	Audio/TC head slantness adjustment
12	J-6087-000-A	Drum Eccentricity Gauge (5)	Upper drum eccentricity adjustment
13	J-6320-870-A	Reel Motor Shaft Slantness Check Fixture	Reel motor shaft slantness check and adjustment
14	J-6152-450-A	Wire Clearance Check Gauge	Clearance check
15	J-6320-680-A	Reel Table Height Gauge	Reel table height adjustment
16	J-6320-880-A	Cassette Base Plate (L)	Reel table height adjustment
17	J-6321-500-A	Tape Guide Adjustment Driver	Tape guide height adjustment
18	J-6325-530-A	Drum Eccentricity Gauge (6)	Upper drum eccentricity adjustment
19	J-6327-850-A	Dial Tension Gauge	Tension arm sensitivity/position adjustment
20	J-6327-930-A	Tension Measurement Tape	Tension arm sensitivity/position adjustment
21	2-034-697-00	Cleaning Piece	Cleaning
22	7-661-018-18	Oil	
23	7-662-001-41	Molyton Grease, No.320 (30g Bottle)	
24	7-662-010-04	Grease, SGL-505 (20g)	
25	7-700-736-01	L-Shaped Hexagonal Wrench (d : 1.27 mm)	
26	7-700-736-05	L-Shaped Hexagonal Wrench (d : 1.5 mm)	
27	7-700-736-06	L-Shaped Hexagonal Wrench (d : 0.89 mm)	
28	7-732-050-20	Tension Scale (50g full scale)	Tension adjustment
29	7-732-050-30	Tension Scale (100g full scale)	
30	8-960-096-51	Alignment Tape, CR2-1B PS	Servo and Tracking alignments (metal particle tape)
31	8-960-096-91	Alignment Tape, CR5-1B PS	Video and Audio alignments (metal particle tape)
32	8-960-098-44	Alignment Tape, CR5-2A PS	Video, Servo and Power Supply/System Control alignments (oxide tape)
33	8-960-096-86	Alignment Tape, CR8-1B PS	Audio alignment (oxide tape)
34	8-960-098-45	Alignment Tape, CR8-1A PS	Tap run adjustment
35	9-911-053-00	Thickness Gauge	Clearance check
36	9-919-573-01	Cleaning Fluid	Cleaning
37	J-6322-370-A	Tension Regulator Position Adjustment Fixture	Tension regulator position adjustment
38	J-6327-980-A	Nonslip Rubber Sheet	Tension arm sensitivity/position adjustment
39	standard product	TENTELOMETER (T2-H7-UMC)	Back tension adjustment

①



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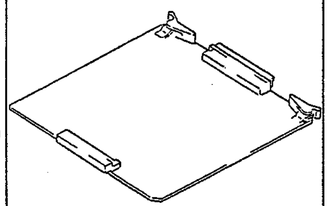

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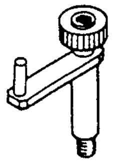

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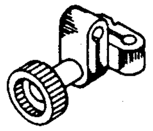

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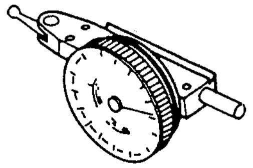

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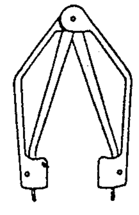

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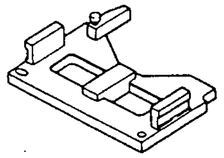

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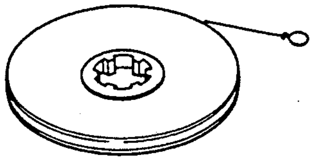

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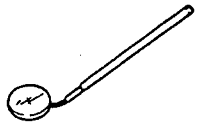

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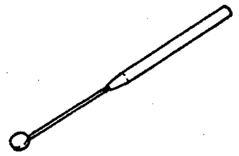

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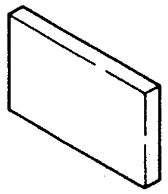

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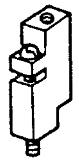

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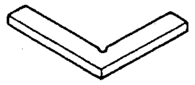

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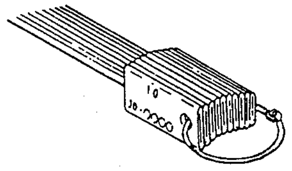

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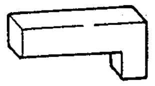

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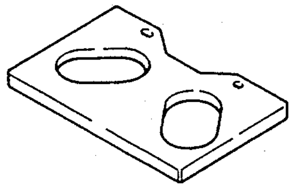

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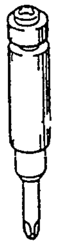

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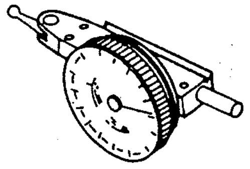

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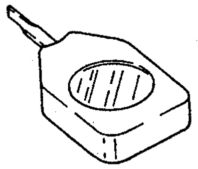

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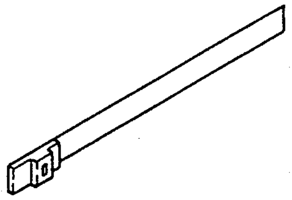

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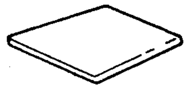

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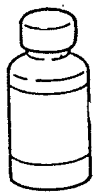

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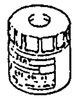

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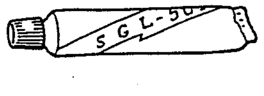

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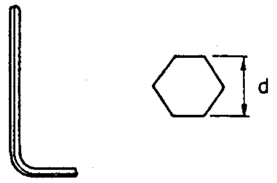

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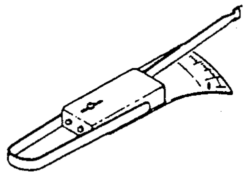

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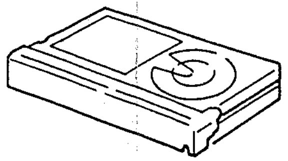
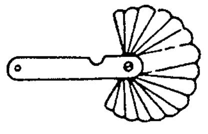
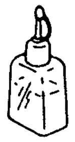


㉟



㊱



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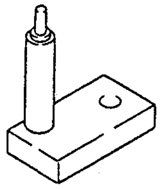

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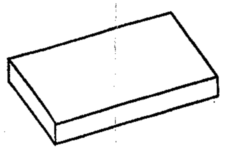
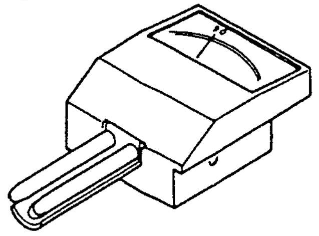


㊴



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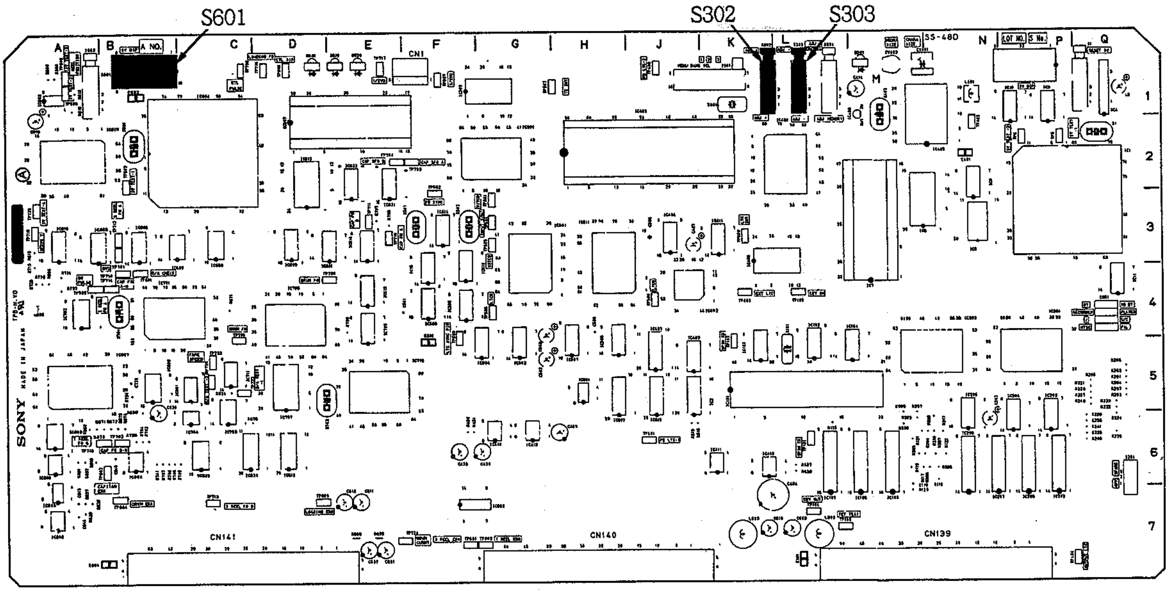
2-21. MAINTENANCE MODE

This equipment provides the maintenance mode which is necessary when performing maintenance and adjustment. The maintenance mode has following modes of seven kinds. Each mode consists of several menus and sub menus. Contents of the maintenance mode are displayed in the video monitor which is connected with MONITOR connector.

MODE	MENU	SUB MENU
A0 : VIDEO CHECK	A001 : TBC thru pass(Y) A002 : TBC thru pass(C) A003 : DEMOD level(Y) A004 : DEMOD level(C) A005 : DIG. video level(Y) A006 : DIG. video level(B) A007 : DIG. video level(R)	———
A1 : VIDEO ADJUST (RF ADJUST)	RF LEVEL ADJUST	001 : Y-Ach 002 : Y-Bch 003 : C-Ach 004 : C-Bch
	RF COS. EQ. 1 ADJUST	005 : Y-Ach 006 : Y-Bch 007 : C-Ach 008 : C-Bch
	RF COS. EQ. 2 MAIN ADJUST	009 : Y-Ach 010 : Y-Bch 011 : C-Ach 012 : C-Bch
	RF COS. EQ. 2 SUB ADJUST	013 : Y-Ach 014 : Y-Bch 015 : C-Ach 016 : C-Bch
	METAL REC CUR. ADJUST	017 : METAL Y-Ach 018 : METAL Y-Bch 019 : METAL C-Ach 020 : METAL C-Bch
	OXIDE REC CUR. ADJUST	021 : OXIDE Y-Ach 022 : OXIDE Y-Bch 023 : OXIDE C-Ach 024 : OXIDE C-Bch
B0 : SERVO CHECK	B01 : INPUT CHECK	B011 : CASSETTE SW B012 : CASSETTE COMP. SW B013 : TOP/END SENSOR B014 : DEW SENSOR B015 : REC INHIBIT SW
	B02 : MOTOR CHECK	B021 : S REEL B022 : T REEL B023 : THREADING B024 : CASSETTE COMP. B025 : CAPSTAN MOTOR B026 : DRUM MOTOR B027 : REEL POSITION
	B03 : PLUNGER SOL. CHECK	B031 : PINCH ROLLER B032 : S REEL BRAKE B033 : T REEL BRAKE B034 : CLEANING ROLLER
	B04 : REEL/CAPSTAN MOTOR & FG CHECK	———
B1 : SERVO ADJUST	B101 : B102-B108 ADJ. B102 : S REEL FG DUTY B103 : T REEL FG DUTY B104 : CAPSTAN FG DUTY B105 : S REEL OFFSET/FRIC B106 : T REEL OFFSET/FRIC B107 : S REEL TORQUE B108 : T REEL TORQUE B109 : CAPSTAN SPEED B110 : RF SWITCHING POS. B111 : TRACKING CENTER B112 : S TENSION SENSOR B113 : T TENSION SENSOR B114 : PICTURE SPLITTING B115 : FWD TENSION B116 : REV TENSION B117 : NV RAM CONTROL	———
C0 : DT CHECK	C01 : Check Interface with DT-29 board C02 : Check strain gauge feed back loop	———
C1 : DT ADJUST	C11 : De-distortion waves C12 : DT Sw. Position C13 : Strain Gauge gains C14 : DT drive amplitudes C15 : Save adjust data	———
F : OTHERS	F00 : rom version F01 : front panel check F02 : sub panel check F03 : F04 : syscon panel check F05 : CF data check F06 : memory check F07 : digital audio check F08 : TBC initialize	———

Following switches on the SS-48DP board or search dial are used so as to execute the maintenance mode.

SS-48DP board



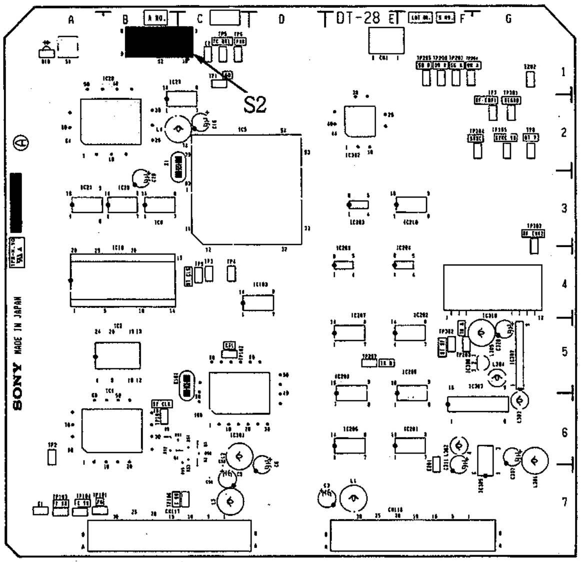
S601-4 (B-1) : SERVO ADJUST/VIDEO ADJUST SW
Set this switch to ON (CLOSE) when executing the servo system adjustment mode (B1 : SERVO ADJUST) and video system adjustment mode (A1 : VIDEO ADJUST) in the maintenance mode.

S601-7 (B-1) : SERVO CHECK SW
Set this switch to ON (CLOSE) when executing the servo system check adjustment mode (B0 : SERVO CHECK) in the maintenance mode.

S302 (K-1) : ADJ (+) SW
Press this switch when entering into the maintenance mode. Also press this switch when executing the menu which is selected by search dial.

S303 (L-1) : ADJ (−) SW
Press this switch when returning to the menu picture or mode picture of the maintenance mode. Also press this switch when closing the maintenance mode.

DT-28 board


A
B
C
D
DT-28
E
F
G
S2
1
2
3
4
5
6
7
SONY MADE IN JAPAN

S2-1, -2, -5 (B-1) : DT ADJUST SW

Set these switches to ON (CLOSE) when executing the DT system adjustment mode (C1 : DT ADJUST) in the maintenance mode.

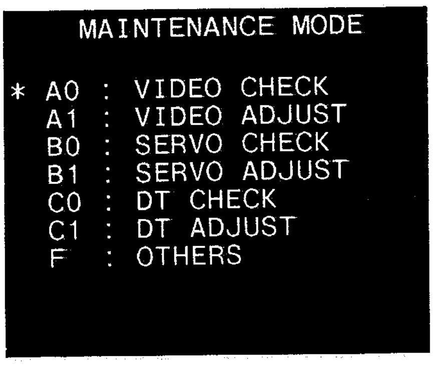
Search Dial : Select a menu or sub menu in the jog mode.

2-21-1. Video System Check Mode (A0 : VIDEO CHECK)

Video system is checked automatically or semiautomatically in this mode.

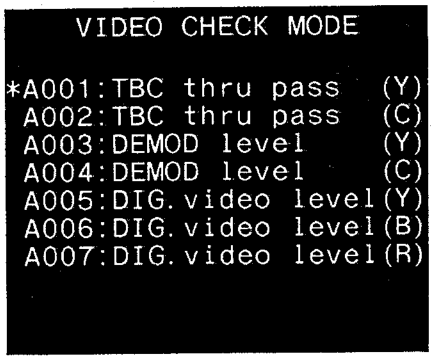
- **Procedure**

1. Press S302 switch on the SS-48DP board.
   Then the unit enters into the maintenance mode. Modes of seven kinds are displayed on the monitor.
2. Press the search dial for put the unit into the jog mode, and move the * mark to "A0 : VIDEO CHECK" mode which is displayed on the monitor.



```
   MAINTENANCE MODE

* A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
  B0 : SERVO CHECK
  B1 : SERVO ADJUST
  C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

3. Press S302 switch on the SS-48DP board.
   Then "A0 : VIDEO CHECK" mode is selected, and menus are displayed on the monitor.

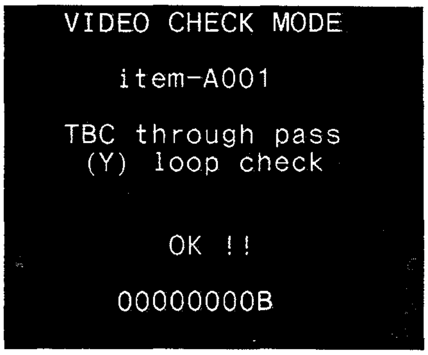


```
   VIDEO CHECK MODE

*A001:TBC thru pass   (Y)
 A002:TBC thru pass   (C)
 A003:DEMOD level     (Y)
 A004:DEMOD level     (C)
 A005:DIG.video level(Y)
 A006:DIG.video level(B)
 A007:DIG.video level(R)
```

4. Move the * mark to a desired menu by the search dial (jog mode).
5. Press S302 switch on the SS-48DP board, and execute the * marked menu.
   Then check is executed automatically.
6. "OK !!" is displayed on the monitor when the check finishes.
   If the result of the check is NG, "NG!!" is displayed on the monitor.
   In this case, check the related circuit.
7. Press S303 switch on the SS-48DP board to return to the menu picture.
8. If there are other menus wishing to be checked, repeat the steps 4 to 7.
9. When all the checks are performed, press S303 switch twice to return to the mode picture.
10. When closing the maintenance mode, press S303 switch on the SS-48DP board.

A001 : TBC thru pass (Y)

This mode checks whether the digital system (Y) on the TBC-17P board acts normally or not, automatically.



```
VIDEO CHECK MODE

    item-A001

TBC through pass
 (Y) loop check


      OK !!

    00000000B
```

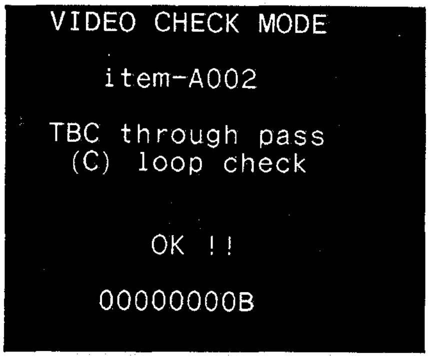
In case of NG

If "NG" is displayed, watch the error indication on the lower on the monitor.
There is unusual on the bit indicated "1". Check the DATA bit indicated "1" of IC501, 503, 504 and 507 on the TBC-17P board.

ex : unusual bit
↓
00100000B
(MSB) (LSB)

A002 : TBC thru pass (C)

This mode checks whether the digital system (C) on the TBC-17P board acts normally or not, automatically.



```
VIDEO CHECK MODE

    item-A002

TBC through pass
 (C) loop check


      OK !!

    00000000B
```

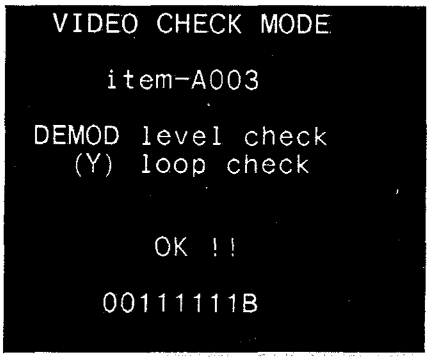
In case of NG

If "NG!!" is displayed, watch the error indication on the lower on the monitor.
There is unusual on the bit indicated "1". Check the DATA bit indicated "1" of IC501, 503, 504 and 507 on the TBC-17P board.

ex : unusual bit
↓
00100000B
(MSB) (LSB)

A003 : DEMOD level (Y)

This mode checks whether the signal level of DEMOD (Y) system on MDM-5P board is correct or not, automatically.



```
VIDEO CHECK MODE

    item-A003

DEMOD level check
  (Y) loop check


      OK !!

    00111111B
```

In case of NG

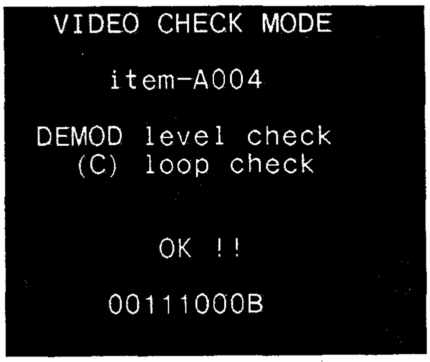
Adjust RV417 on MDM-5P board to the specified level.
(Refer to electrical alignment.)

A004 : DEMOD level (C)

This mode checks whether the signal level of DEMOD (C) system on MDM-5P board is correct or not, automatically.

In case of NG

Adjust RV817 on MDM-5P board to the specified level.
(Refer to electrical alignment.)



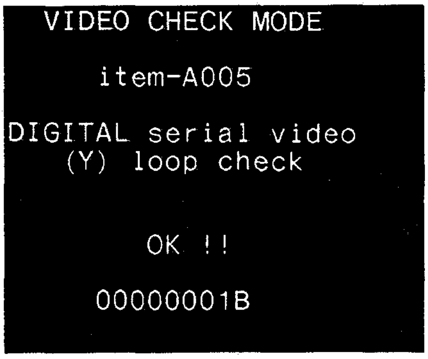
```
VIDEO CHECK MODE

    item-A004

DEMOD level check
  (C) loop check


       OK !!

    00111000B
```

A005 : DIG. video level (Y)

This mode checks whether the digital serial video system (Y) signal on DIF-11P board acts normally or not, automatically.

In case of NG

Adjust RV103 on DIF-11P board to the specified level.
(Refer to electrical alignment.)



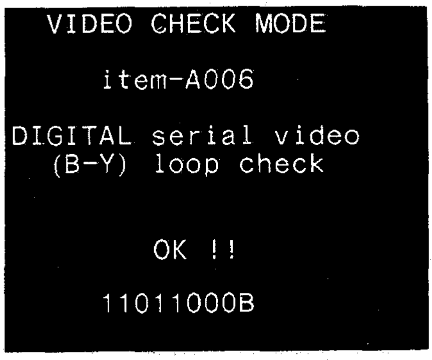
```
VIDEO CHECK MODE

    item-A005

DIGITAL serial video
  (Y) loop check


       OK !!

    00000001B
```

A006 : DIG. video level (B)

This mode checks whether the digital serial video system (B-Y) signal on DIF-11P board acts normally or not, automatically.

In case of NG

Adjust RV108 on DIF-11P board to the specified level.
(Refer to electrical alignment.)



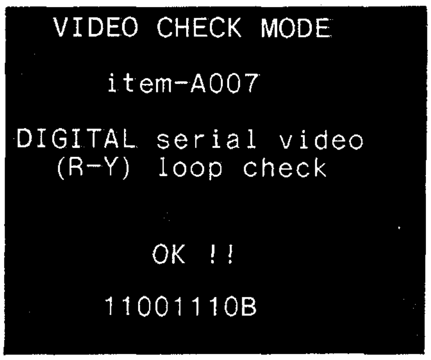
```
VIDEO CHECK MODE

    item-A006

DIGITAL serial video
  (B-Y) loop check


       OK !!

    11011000B
```

A007 : DIG. video level (R)

This mode checks whether the digital serial video system (R-Y) signal on DIF-11P board acts normally or not, automatically.

In case of NG

Adjust RV108 on DIF-11P board to the specified level.
(Refer to electrical alignment.)



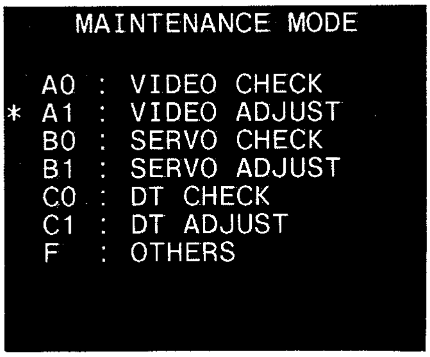
```
VIDEO CHECK MODE

    item-A007

DIGITAL serial video
  (R-Y) loop check


       OK !!

    11001110B
```

2-21-2. Video System Adjustment Mode (A1 : VIDEO ADJUST)

Video system is adjusted according to the munu operation easily.

- **Procedure**

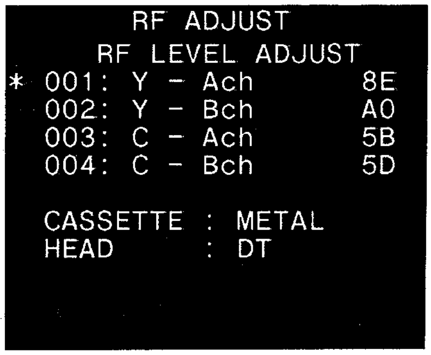
1. Turn OFF the POWER, and set S601-4 switch on SS-48DP board to ON (CLOSE).
2. Turn ON the POWER.
3. Press the EJECT button to put the unit into the EJECT mode.
   Note : If the unit is not set to the EJECT mode, the video system adjustment mode does not perform.
4. Press S302 switch on SS-48DP board.
   Then the unit enters into the maintenance mode. Modes of seven kinds are displayed on the monitor.
5. Press the search dial to put the unit into the jog mode, and move * mark to "A1 : VIDEO ADJUST" which is a mode displayed on the monitor.



```
    MAINTENANCE MODE

  A0 : VIDEO CHECK
* A1 : VIDEO ADJUST
  B0 : SERVO CHECK
  B1 : SERVO ADJUST
  C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

6. Press S302 switch on SS-48DP board.
   Then "A1 : VIDEO ADJUST" mode is selected, and menus are displayed on the monitor.
7. Move * mark to a desired menu by the search dial (jog mode).
8. Press S302 switch on SS-48DP board, and execute the * marked menu.

This menu adjusts the video RF level, RF cos. EQ1, RF cos. EQ2, metal REC current and oxide REC current automatically. When the upper drum and/or head drum is replaced, perform this menu.
Refer to electrical alignment about a method of adjustment.



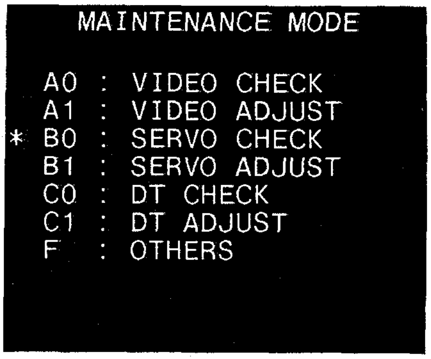
```
         RF ADJUST
      RF LEVEL ADJUST
* 001: Y - Ach        8E
  002: Y - Bch        A0
  003: C - Ach        5B
  004: C - Bch        5D

  CASSETTE : METAL
  HEAD     : DT
```

2-21-3. Servo System Check Mode (B0 : SERVO CHECK)

Servo system is checked automatically or semiautomatically in this mode.

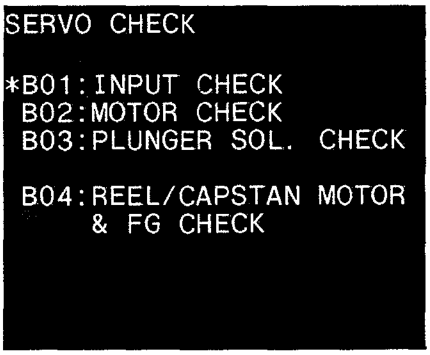
• **Procedure**

1. Turn OFF the POWER, and set S601-7 switch on the SS-48DP board to ON (CLOSE).
2. Turn ON the POWER.
3. Press S302 switch on the SS-48DP board. Then the unit enters into the maintenance mode. Modes of seven kinds are displayed on the monitor.
4. Press the search dial to put the unit into the jog mode, then move the * mark to "B0 : SERVO CHECK" which is a mode displayed on the monitor.



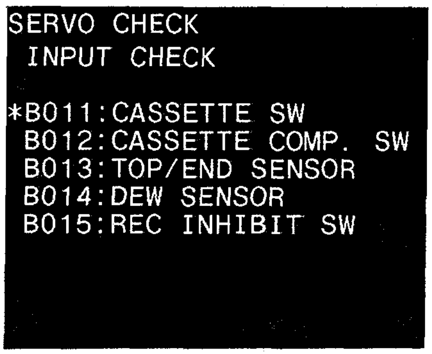
```
   MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
* B0 : SERVO CHECK
  B1 : SERVO ADJUST
  C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

5. Press S302 switch on the SS-48DP board.
   Then "B0 : SERVO CHECK" mode is selected, and menus are displayed on the monitor.
6. Move the * mark to a desired menu by the search dial (Jog mode).



```
SERVO CHECK

*B01:INPUT CHECK
 B02:MOTOR CHECK
 B03:PLUNGER SOL. CHECK

 B04:REEL/CAPSTAN MOTOR
     & FG CHECK
```

7. Press S302 switch on the SS-48DP board.
   Then the sub menus are displayed further.



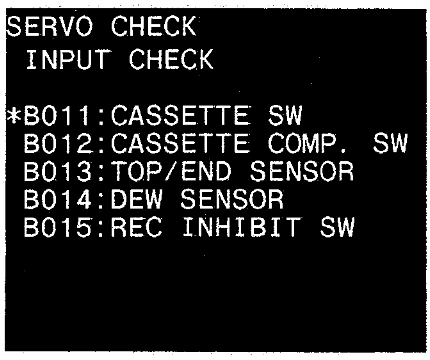
```
SERVO CHECK
 INPUT CHECK

*B011:CASSETTE SW
 B012:CASSETTE COMP. SW
 B013:TOP/END SENSOR
 B014:DEW SENSOR
 B015:REC INHIBIT SW
```

8. Move the * mark to a desired sub menu by the search dial (jog mode).

9. Press S302 switch on the SS-48DP board, and execute the * marked sub menu.
   (Refer to each page of menu item about a method of check.)
   While the sub menu is being performed, the keyboard operation is possible by pressing S302 on the SS-48DP board. (Character displays on the monitor continuously.)
   Then, mechanical operation is possible in the maintenance mode.
   In this state, the key board operation is returned to the state of the maintenance mode by pressing S303 on the SS-48DP board.
10. When check is finished, press S303 switch on the SS-48DP board to return to the submenu screen. Or, press switch S302 twice to return to the menu screen.
11. If there are other menus or submenus wishing to be checked, repeat the steps 4 to 10.
12. When all the checks are performed, press S303 switch on the SS-48DP board three times to return to the mode screen.
13. When closing the maintenance mode, press S303 on the SS-48DP board.
   Next, turn OFF the POWER, and reset S601-7 switch on the SS-48DP board to OFF (OPEN).

B01 : INPUT CHECK

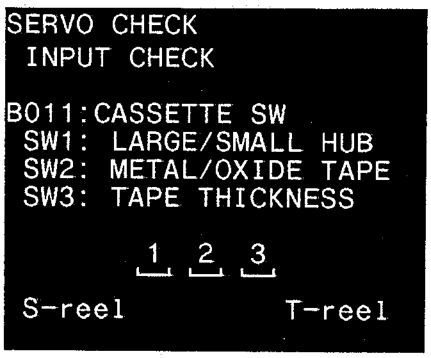
The sub menus of the "B01 : INPUT CHECK" are explained here.



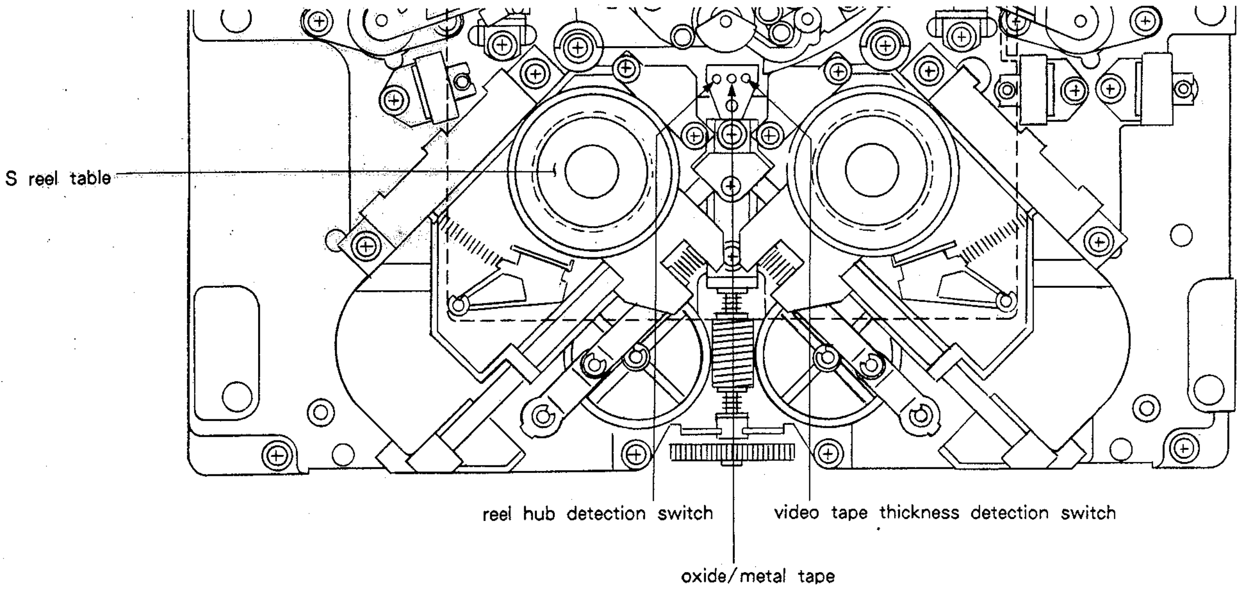
```
SERVO CHECK
 INPUT CHECK

*B011:CASSETTE SW
 B012:CASSETTE COMP. SW
 B013:TOP/END SENSOR
 B014:DEW SENSOR
 B015:REC INHIBIT SW
```

(1) B011 : CASSETTE SW

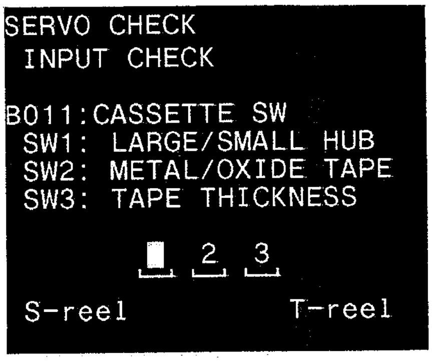
This mode checks the function of the cassette switch (sensor).



```
SERVO CHECK
 INPUT CHECK

B011:CASSETTE SW
 SW1: LARGE/SMALL HUB
 SW2: METAL/OXIDE TAPE
 SW3: TAPE THICKNESS

          1  2  3

 S-reel            T-reel
```

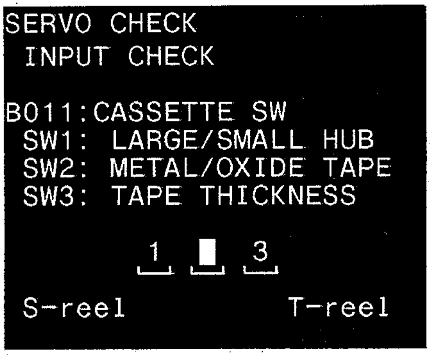

S reel table
reel hub detection switch
video tape thickness detection switch
oxide/metal tape

1. Press the reel hub detection switch (sensor) with finger. Confirm that ■ is displayed on the "1" which is displaying on the monitor.



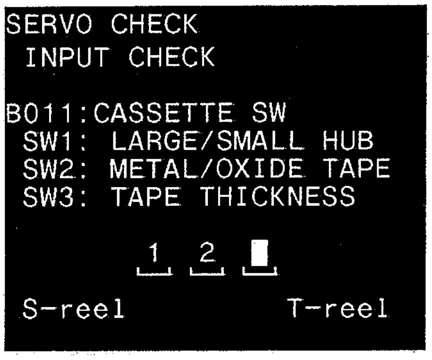
```
SERVO CHECK
 INPUT CHECK

B011:CASSETTE SW
 SW1: LARGE/SMALL HUB
 SW2: METAL/OXIDE TAPE
 SW3: TAPE THICKNESS

           ■  2  3
          └┘ └┘ └┘
 S-reel           T-reel
```

2. Press the oxide/metal tape detection switch (sensor) with finger.
   Confirm that ■ is displayed on the "2" which is displaying on the monitor.



```
SERVO CHECK
 INPUT CHECK

B011:CASSETTE SW
 SW1: LARGE/SMALL HUB
 SW2: METAL/OXIDE TAPE
 SW3: TAPE THICKNESS

           1  ■  3
          └┘ └┘ └┘
 S-reel           T-reel
```

3. Press the video tape thickness detection sensor with finger.
   Confirm that ■ is displayed on the "3" which is displaying on the monitor.



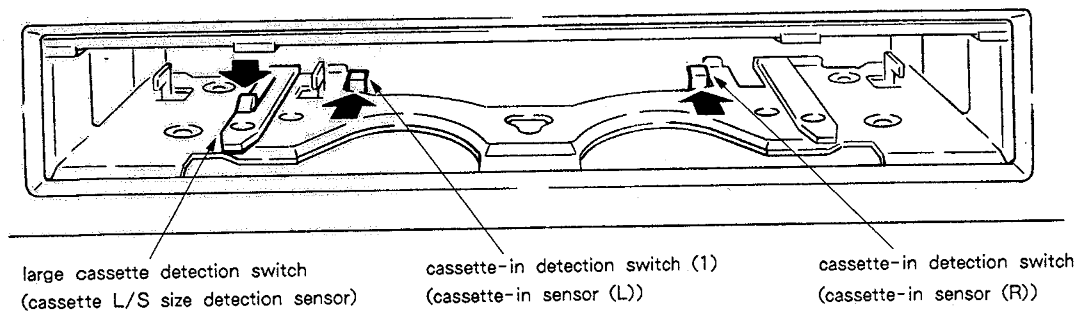
```
SERVO CHECK
 INPUT CHECK

B011:CASSETTE SW
 SW1: LARGE/SMALL HUB
 SW2: METAL/OXIDE TAPE
 SW3: TAPE THICKNESS

           1  2  ■
          └┘ └┘ └┘
 S-reel           T-reel
```

In case of NG
If ■ isn't displayed on the appointed number, check the sensor on the PTC-55 board and the sensor input circuit (DR-118B board).

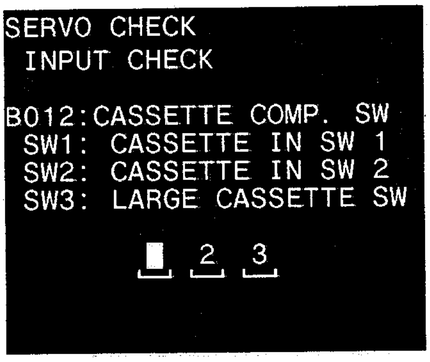
(2) B012 : CASSETTE COMP. SW

This mode checks the function of the Cassette Compartment switch (sensor).

Push up the cassette window with finger

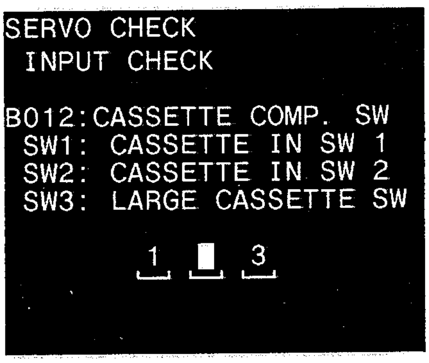

large cassette detection switch
(cassette L/S size detection sensor)
cassette-in detection switch (1)
(cassette-in sensor (L))
cassette-in detection switch (2)
(cassette-in sensor (R))

1. Press the cassette-in detection switch (1) (cassette-in sensor (L)) with finger.
   Confirm that ■ is displayed on the "1" which is displaying on the monitor.



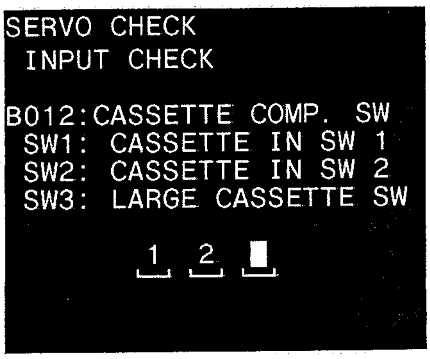
```
SERVO CHECK
 INPUT CHECK

B012:CASSETTE COMP. SW
 SW1: CASSETTE IN SW 1
 SW2: CASSETTE IN SW 2
 SW3: LARGE CASSETTE SW

          ■  2  3
```

2. Press the cassette-in detection switch (2) (cassette-in sensor (R)) with finger.
   Comfirm that ■ is displayed on the "2" which is displaying on the monitor.



```
SERVO CHECK
 INPUT CHECK

B012:CASSETTE COMP. SW
 SW1: CASSETTE IN SW 1
 SW2: CASSETTE IN SW 2
 SW3: LARGE CASSETTE SW

          1  ■  3
```

3. Press the large cassette detection switch (cassette L/S size detection sensor) with finger.
   Comfirm that ■ is displayed on the "3" which is displaying on the monitor.

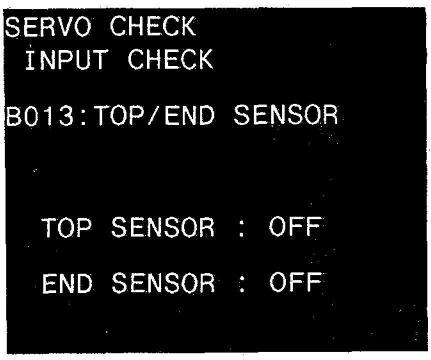


```
SERVO CHECK
 INPUT CHECK

B012:CASSETTE COMP. SW
 SW1: CASSETTE IN SW 1
 SW2: CASSETTE IN SW 2
 SW3: LARGE CASSETTE SW

          1  2  ■
```

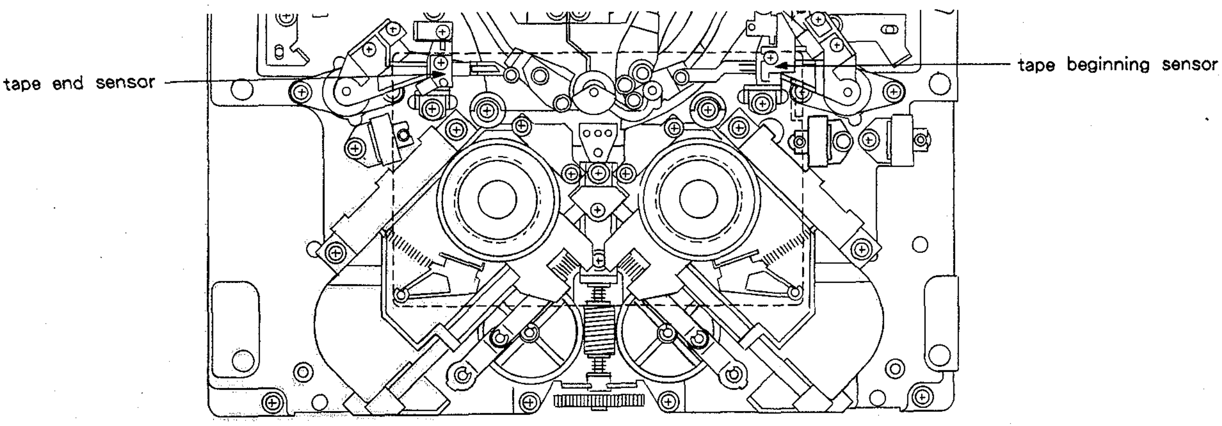
In case of NG
If ■ is not displayed on the appointed number, check the sensor on the PC-62 board and the sensor input circuit (DR-118B board).

(3) B013: TOP/END SENSOR

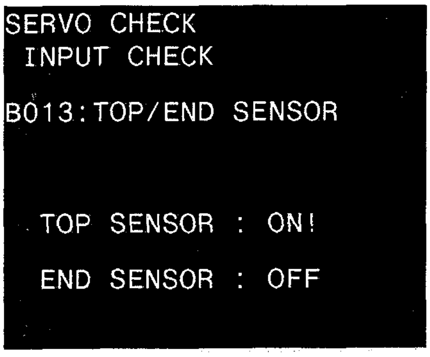
This mode checks the function of the tape beginning/end sensor.



```
SERVO CHECK
 INPUT CHECK

B013:TOP/END SENSOR


  TOP SENSOR : OFF

  END SENSOR : OFF
```

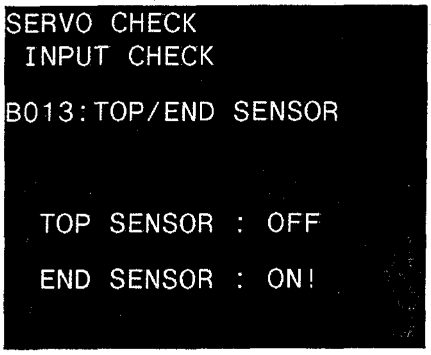


1. Draw a screw driver up to the tape beginning sensor. Confirm that "TOP SENSOR : OFF" which is displaying on the monitor changes into "TOP SENSOR : ON!".



```
SERVO CHECK
 INPUT CHECK

B013:TOP/END SENSOR


  TOP SENSOR : ON!

  END SENSOR : OFF
```

2. Draw a screw driver up to the tape end sensor. Comfirm that "END SENSOR : OFF" which is displaying on the monitor changes into "END SENSOR : ON!".



```
SERVO CHECK
 INPUT CHECK

B013:TOP/END SENSOR


  TOP SENSOR : OFF

  END SENSOR : ON!
```

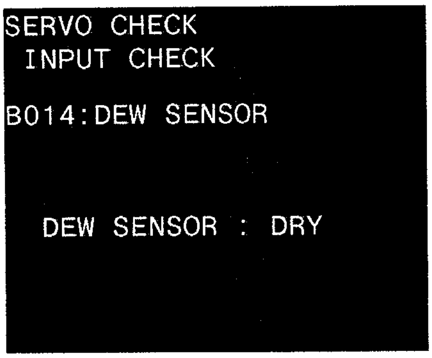
In case of NG

If "OFF" does not change into "ON!", check that the tape beginning/end sensor is normal or not, individually.

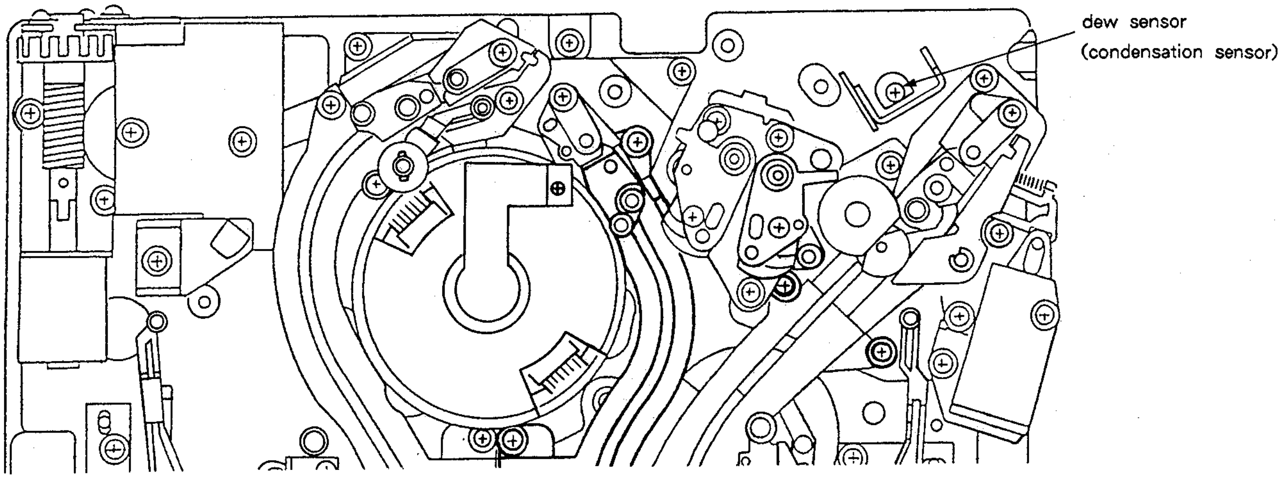
And check the tape beginning/end sensor circuit (DR-118B board).

(4) B014: DEW SENSOR

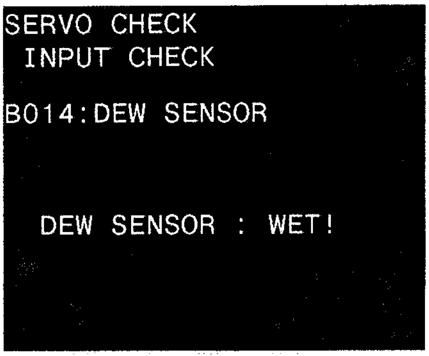
This mode checks the function of the dew (condensation) sensor.



```
SERVO CHECK
 INPUT CHECK

B014:DEW SENSOR


  DEW SENSOR : DRY
```



1. Touch the dew sensor (condensation sensor) softly with a wet applicator.
   Confirm that "DRY" which is in the monitor picture changes into "WET!".



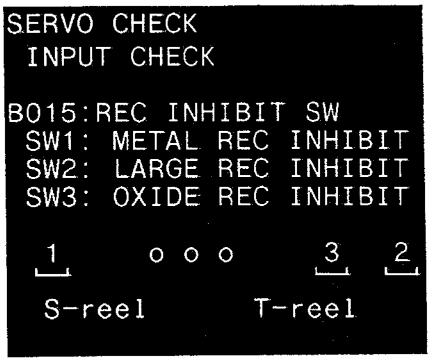
```
SERVO CHECK
 INPUT CHECK

B014:DEW SENSOR


  DEW SENSOR : WET!
```

2. Mop the moisture of the dew sensor (condensation sensor) with a dry applicator, or blow the sensor with a blower to evaporate.
   Confirm that "WET!" which is in the monitor picture changes into "DRY".

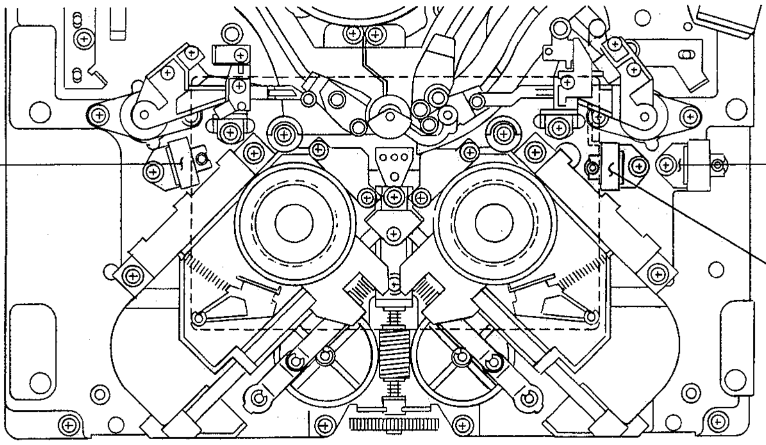
In case of NG
If "DRY" does not change to "WET!" when the dew sensor (condensation sensor) is damped, check that condensation sensor is normal or not, individually.
And check the dew sensor amplifier (DS-31 board).

(5) B015 : REC INHIBIT SW

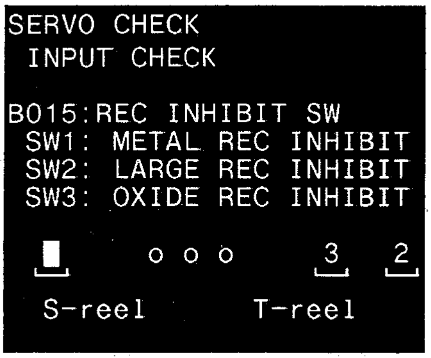
This mode checks the REC inhibit switch.



```
SERVO CHECK
 INPUT CHECK

B015:REC INHIBIT SW
 SW1: METAL REC INHIBIT
 SW2: LARGE REC INHIBIT
 SW3: OXIDE REC INHIBIT

 1       o o o      3   2

  S-reel        T-reel
```

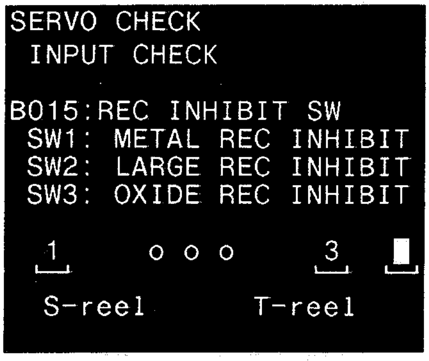

metal REC inhibit switch
(S cassette Miss-REC sensor)
large REC inhibit switch
(L cassette Miss-REC sensor)
oxide REC inhibit switch
(oxide tape Miss-REC sensor)

1. Press the metal REC inhibit switch (S cassette Miss-REC sensor).
   Confirm that ■ is displayed on the "1" which is displaying on the monitor.



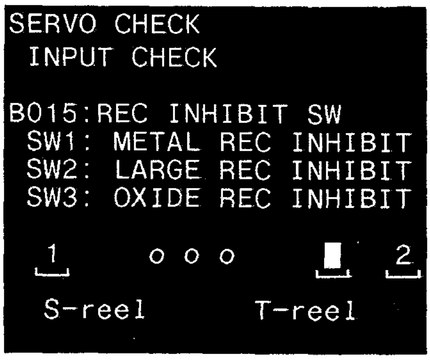
```
SERVO CHECK
 INPUT CHECK

B015:REC INHIBIT SW
 SW1: METAL REC INHIBIT
 SW2: LARGE REC INHIBIT
 SW3: OXIDE REC INHIBIT

 ■       o o o      3   2

  S-reel        T-reel
```

2. Press the large REC inhibit switch (L cassette Miss-REC sensor).
   Confirm that ■ is displayed on the "2" which is displaying on the monitor.



```
SERVO CHECK
 INPUT CHECK

B015:REC INHIBIT SW
 SW1: METAL REC INHIBIT
 SW2: LARGE REC INHIBIT
 SW3: OXIDE REC INHIBIT

 1       o o o      3   ■

  S-reel        T-reel
```

3. Press the oxide REC inhibit switch (Oxide tape Miss-REC sensor).
   Confirm that ■ is displayed on the "3" which is displaying on the monitor.

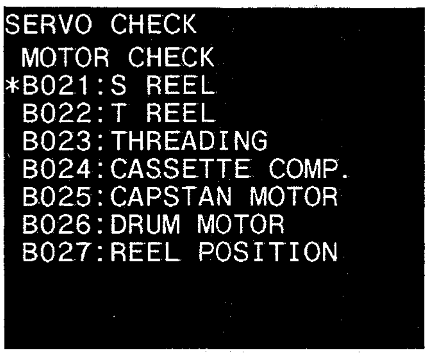


```
SERVO CHECK
 INPUT CHECK

B015:REC INHIBIT SW
 SW1: METAL REC INHIBIT
 SW2: LARGE REC INHIBIT
 SW3: OXIDE REC INHIBIT

 1       o o o     █   2
 S-reel         T-reel
```

In case of NG
If ■ is not displayed on the appointed number, check the sensor on the PTC-43 board and the sensor input circuit (DR-118B board).

B02 : MOTOR CHECK

The sub menus of the "B02 : Motor Check" are explained here.

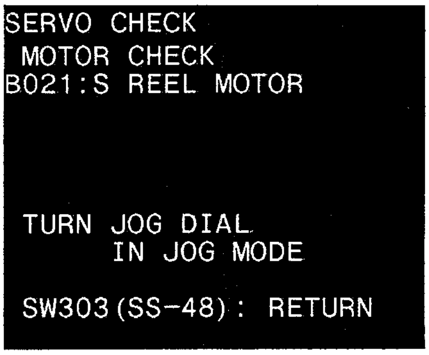


```
SERVO CHECK
 MOTOR CHECK
*B021:S REEL
 B022:T REEL
 B023:THREADING
 B024:CASSETTE COMP.
 B025:CAPSTAN MOTOR
 B026:DRUM MOTOR
 B027:REEL POSITION
```

(1) B021 : S REEL

This mode checks the rotation of the S reel motor.

Set the search dial to the jog mode, and turn it in the direction of forward and reverse. Confirm that the S reel motor rotates in the dial appointed direction, after the brake solenoid energized to release the reel brake.



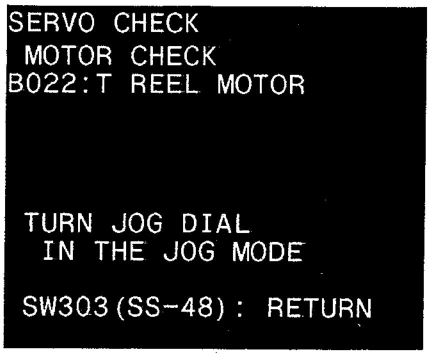
```
SERVO CHECK
 MOTOR CHECK
B021:S REEL MOTOR



 TURN JOG DIAL
      IN JOG MODE

 SW303(SS-48) :  RETURN
```

In case of NG
If energizing sound of the brake solenoid cannot hear and the S reel motor does not rotate in the dial appointed direction, check the reel motor driver circuit (DR-118B board).

(2) B022 : T REEL

This mode checks the rotation of the T reel motor.

Set the search dial to the jog mode, and turn in the direction of forward and reverse.
Confirm that the T reel motor rotates in the dial appointed direction, after the brake solenoid energized to release the reel brake.

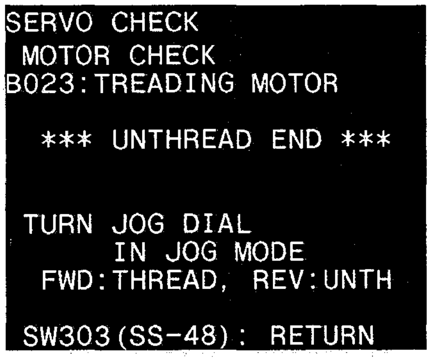


```
SERVO CHECK
 MOTOR CHECK
B022:T REEL MOTOR



 TURN JOG DIAL
  IN THE JOG MODE

 SW303(SS-48) :  RETURN
```

In case of NG
If energizing sound of the brake solenoid cannot hear, and the T reel motor does not rotate in the dial appointed direction, check the reel motor driver circuit (DR-118B board).

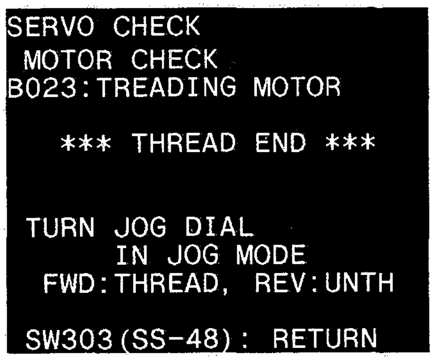
(3) B023 : THREADING

This mode checks the rotation of the threading motor and threading-end/unthreading-end sensor.



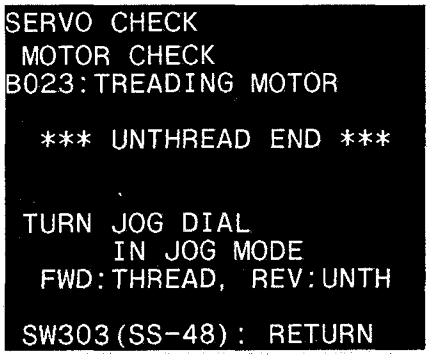
```
SERVO CHECK
 MOTOR CHECK
B023:TREADING MOTOR

  *** UNTHREAD END ***


 TURN JOG DIAL
      IN JOG MODE
  FWD:THREAD,  REV:UNTH

 SW303(SS-48) :  RETURN
```

1. Set the search dial to the jog mode, and turn it in the direction of forward.
   Confirm that S slider, T slider and P slider are threaded, and "THREAD END" is displayed on the monitor picture.



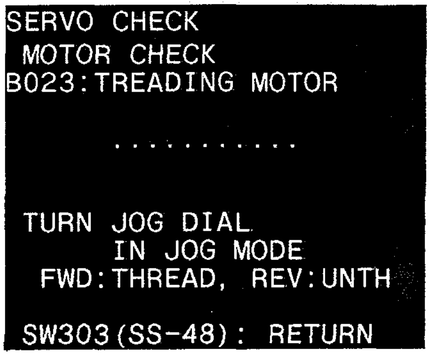
```
SERVO CHECK
 MOTOR CHECK
B023:TREADING MOTOR

   *** THREAD END ***


 TURN JOG DIAL
      IN JOG MODE
  FWD:THREAD,  REV:UNTH

 SW303(SS-48) :  RETURN
```

2. Turn the search dial in the direction of reverse.
   Confirm that S slider, T slider and P slider are unthreaded, and "UNTHREAD END" is displayed on the monitor picture.



```
SERVO CHECK
 MOTOR CHECK
B023:TREADING MOTOR

  *** UNTHREAD END ***


 TURN JOG DIAL
      IN JOG MODE
  FWD:THREAD,  REV:UNTH

 SW303(SS-48) :  RETURN
```

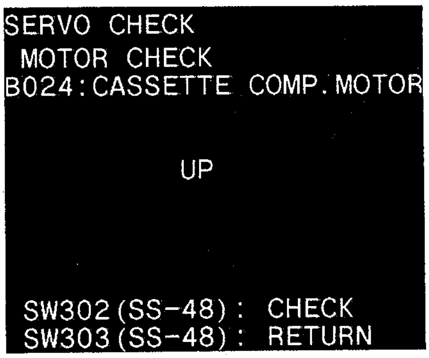
In case of NG
If the threading motor does not rotate, "···········" is displayed on the monitor after finishing threading, or "UNTHREAD END" is not displayed in the monitor after finishing unthreading, confirm that whether the threading motor and sensor on the PTC-49 board are normal or not. Also, check the threading motor driver circuit, threading FG amplifier circuit (DR-118B board), and threading TOP/END switch.



```
SERVO CHECK
 MOTOR CHECK
B023:TREADING MOTOR

       ...........


 TURN JOG DIAL
      IN JOG MODE
  FWD:THREAD,  REV:UNTH

 SW303(SS-48) :  RETURN
```

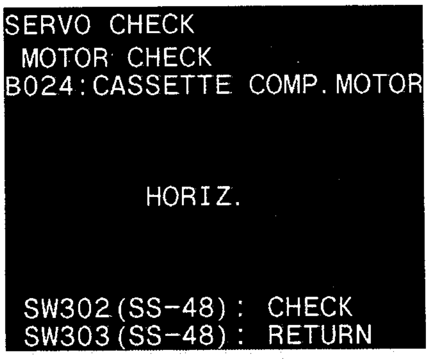
(4) B024: CASSETTE COMP.

This mode checks the cassette compartment motor.



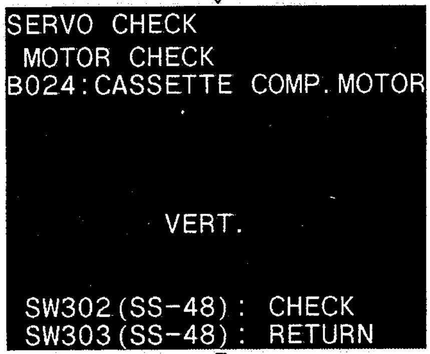
```
SERVO CHECK
 MOTOR CHECK
B024:CASSETTE COMP.MOTOR

          UP

 SW302(SS-48) :  CHECK
 SW303(SS-48) :  RETURN
```

Press S302 switch on the SS-48DP board.
Confirm that cassette compartment goes down.
Confirm that cassette compartment goes up when pressing S302 switch again. (The display on the monitor changes in the reverse order when it going down.)



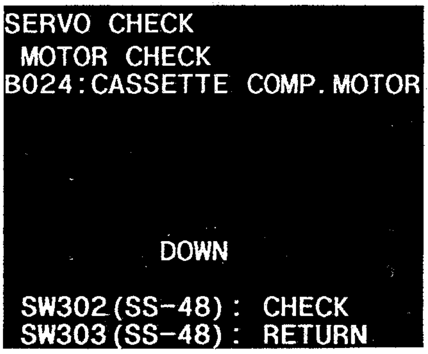
```
SERVO CHECK
 MOTOR CHECK
B024:CASSETTE COMP.MOTOR

         HORIZ.

 SW302(SS-48) :  CHECK
 SW303(SS-48) :  RETURN
```

⇩



```
SERVO CHECK
 MOTOR CHECK
B024:CASSETTE COMP.MOTOR

          VERT.

 SW302(SS-48) :  CHECK
 SW303(SS-48) :  RETURN
```

⇩

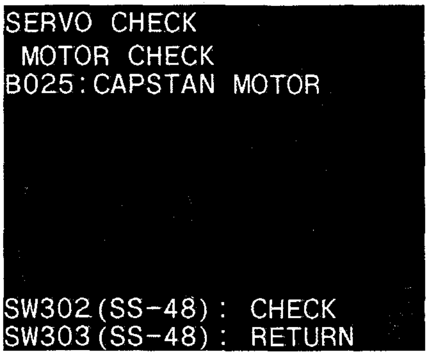


```
SERVO CHECK
 MOTOR CHECK
B024:CASSETTE COMP.MOTOR

          DOWN

 SW302(SS-48) :  CHECK
 SW303(SS-48) :  RETURN
```

In case of NG
If the display in the monitor doesn't change, check the cassette compartment motor and the sensor input circuit (DR-118B borad).

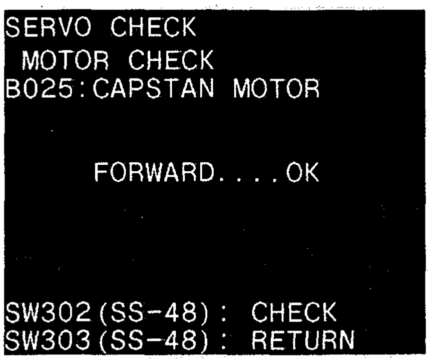
(5) B025 : CAPSTAN MOTOR

This mode checks the direction of the rotation of the capstan motor.



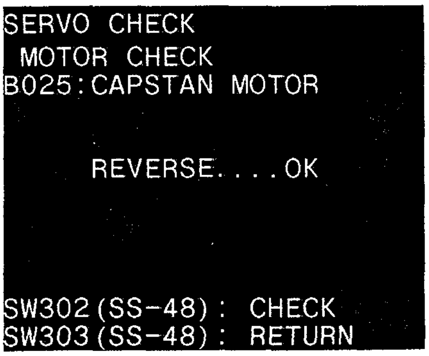
```
SERVO CHECK
 MOTOR CHECK
B025:CAPSTAN MOTOR




SW302(SS-48) :  CHECK
SW303(SS-48) :  RETURN
```

1. Press S302 switch on the SS-48DP board.
   Confirm that “FORWORD...OK” is displayed on the monitor.



```
SERVO CHECK
 MOTOR CHECK
B025:CAPSTAN MOTOR

      FORWARD....OK


SW302(SS-48) :  CHECK
SW303(SS-48) :  RETURN
```

2. Press S302 switch on the SS-48DP board again.
   Confirm that “REVERSE...OK” is displayed on the monitor.

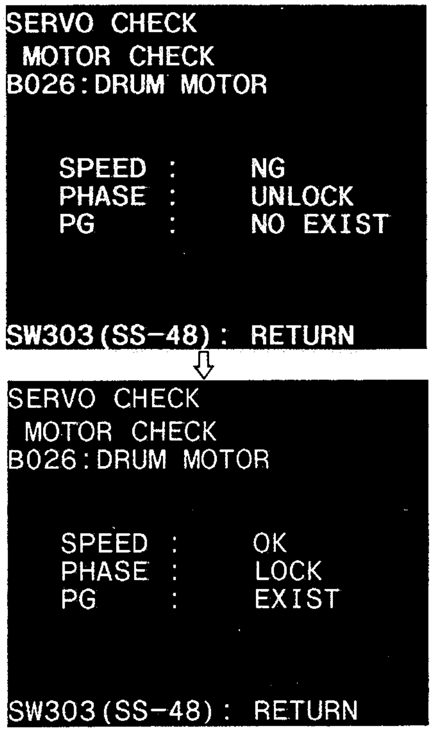


```
SERVO CHECK
 MOTOR CHECK
B025:CAPSTAN MOTOR

      REVERSE....OK


SW302(SS-48) :  CHECK
SW303(SS-48) :  RETURN
```

In case of NG
If the display on the monitor does not change, check the capstan motor and the capstan motor driver circuit (DR-118B board).

(6) B026: DRUM MOTOR

This mode checks the rotation of the drum motor.



```
SERVO CHECK
 MOTOR CHECK
B026:DRUM MOTOR

   SPEED :     NG
   PHASE :     UNLOCK
   PG    :     NO EXIST

SW303(SS-48) : RETURN
```

```
SERVO CHECK
 MOTOR CHECK
B026:DRUM MOTOR

   SPEED :     OK
   PHASE :     LOCK
   PG    :     EXIST

SW303(SS-48) : RETURN
```

SPEED : Confirm that the display on the monitor changes into “OK”.

PHASE : Confirm that the display on the monitor changes into “LOCK”.

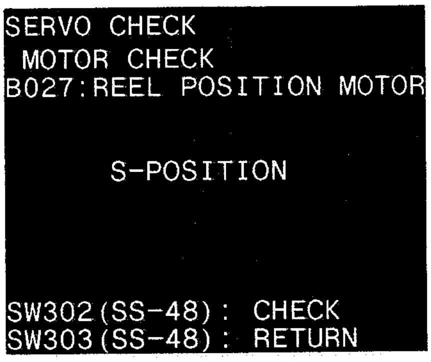
PG : Confirm that the display on the monitor changes into “EXIST”.

In case of NG

If the display on the monitor does not change, check the drum motor, drum motor driver circuit, drum FG amplifier circuit, and drum PG amplifier circuit (DR-118B board).

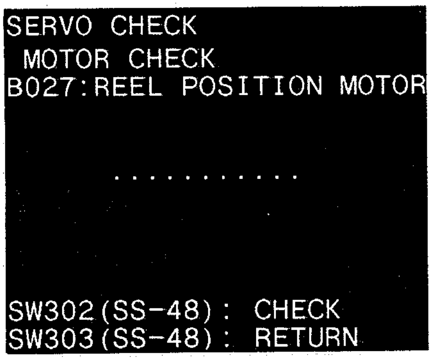
(7) B027 : REEL POSITION MOTOR

This mode checks the action of the reel position motor and the function of the reel L/S position sensor.



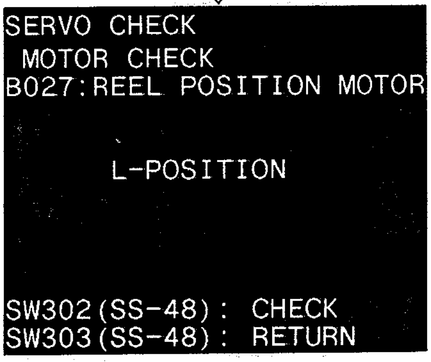
```
SERVO CHECK
 MOTOR CHECK
B027:REEL POSITION MOTOR

      S-POSITION


SW302(SS-48): CHECK
SW303(SS-48): RETURN
```

Press S302 switch on the SS-48DP board.
Confirm that the reel table moves S-POSITION to LPOSITION, and the display changes.



```
SERVO CHECK
 MOTOR CHECK
B027:REEL POSITION MOTOR

      ...........


SW302(SS-48): CHECK
SW303(SS-48): RETURN
```

⇩

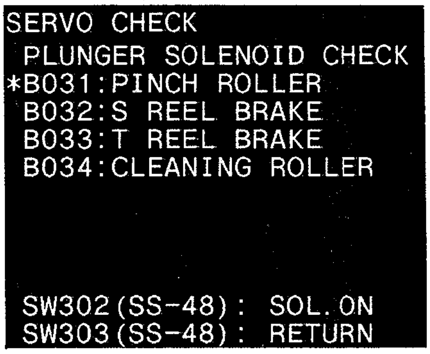


```
SERVO CHECK
 MOTOR CHECK
B027:REEL POSITION MOTOR

      L-POSITION


SW302(SS-48): CHECK
SW303(SS-48): RETURN
```

In case of NG
If the reel table does not move and the display on the monitor does not change, check the reel shift motor, reel L/S position sensor (PTC-42 board) and reel position motor driver circuit (DR-118B board).

B03 : PLUNGER SOL. CHECK

The submenus of the "B03 : PLUNGER SOL. CHECK" are explained here.

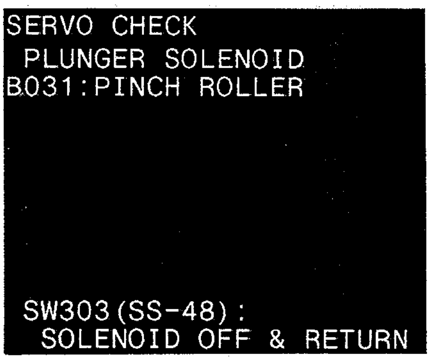


```
SERVO CHECK
 PLUNGER SOLENOID CHECK
*B031:PINCH ROLLER
 B032:S REEL BRAKE
 B033:T REEL BRAKE
 B034:CLEANING ROLLER


 SW302(SS-48) :  SOL.ON
 SW303(SS-48) :  RETURN
```

(1) B031 : PINCH ROLLER

This mode checks the action of the pinch roller solenoid.

1. Press S302 switch on the SS-48DP board.
   Confirm with a sound that the pinch solenoid is set to ON.
2. Press S303 switch on the SS-48DP board.
   Then the voltage which is supplied to pinch solenoid is set to OFF. And the monitor returns to the sub menu picture.
3. Push the pinch lever in the direction of the pinch solenoid lightly.
   Then iron core of the pinch solenoid is back to the original position.



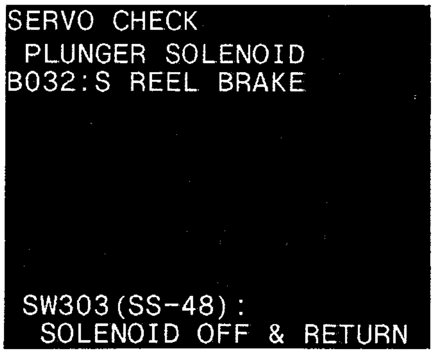
```
SERVO CHECK
 PLUNGER SOLENOID
B031:PINCH ROLLER


 SW303(SS-48) :
  SOLENOID OFF & RETURN
```

In case of NG
If there is no sound that the pinch solenoid is set to ON, and the monitor does not change, check the pinch solenoid and circuit.

(2) B032 : S REEL BRAKE

This mode checks the action of the S reel brake solenoid.

1. Press S302 switch on the SS-48DP board.
   Confirm with a sound that the S reel brake solenoid is set to ON.
2. Press S303 switch on the SS-48DP board.
   Then iron core of the S reel brake solenoid is back to the original position. And the monitor picture returns to the sub menu picture.



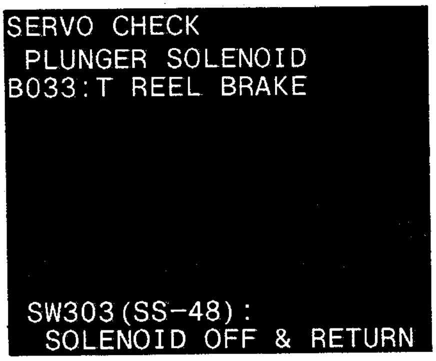
```
SERVO CHECK
 PLUNGER SOLENOID
B032:S REEL BRAKE


 SW303(SS-48) :
  SOLENOID OFF & RETURN
```

In case of NG
If there is no sound that S reel brake solenoid is set to ON, and the monitor picture does not change, check the S reel brake solenoid, reel brake plunger and driver circuit (DR-118B board).

(3) B033 : T REEL BRAKE

This mode checks the action of the T reel brake solenoid.

1. Press S302 switch on the SS-48DP board.
   Confirm with a sound that the T reel brake solenoid is set to ON.
2. Press S303 switch on the SS-48DP board.
   Then iron core of the T reel brake solenoid is back to the original position. And the monitor returns to the sub menu picture.



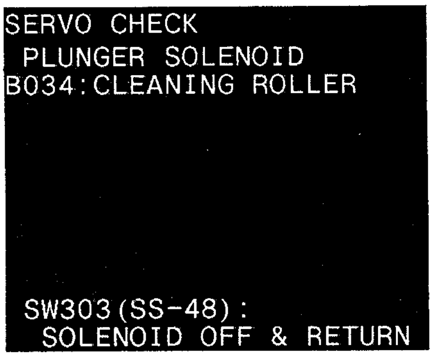
```
SERVO CHECK
 PLUNGER SOLENOID
B033:T REEL BRAKE




 SW303(SS-48):
  SOLENOID OFF & RETURN
```

In case of NG
If there is no sound that the T reel brake solenoid is set to ON, and the monitor doesn't change, check the T reel brake solenoid, reel brake plunger and driver circuit (DR-118B board).

(4) B034 : CLEANING ROLLER

This mode checks the action of the cleaning roller solenoid.

1. Press S302 switch on the SS-48DP board.
   Confirm that the cleaning roller solenoid is set to ON, and the cleaning roller is pressed to drum.
2. Press S302 switch on the SS-48DP board.
   Then the cleaning roller solenoid is set to OFF, and the cleaning roller is aparted from the drum. And the monitor returns to the sub menu picture.



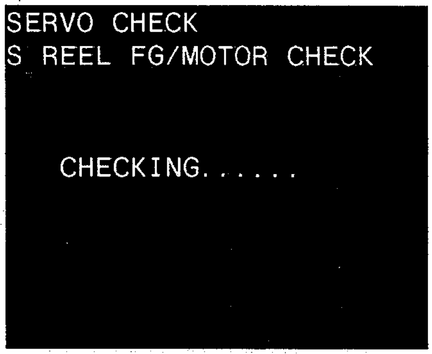
```
SERVO CHECK
 PLUNGER SOLENOID
B034:CLEANING ROLLER




 SW303(SS-48):
  SOLENOID OFF & RETURN
```

In case of NG
If the cleaning roller is not pressed to the drum, check the cleaning roller solenoid and solenoid drive circuit (DR-118B board).

B04 : REEL/CAPSTAN MOTOR & FG CHECK

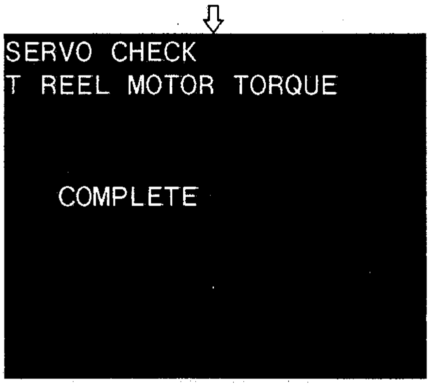
When pressig S302 on the SS-48DP board, the following check is performed automatically.

S REEL FG/MOTOR CHECK
T REEL FG/MOTOR CHECK
CAPSTAN FG/MOTOR CHECK
S REEL FRICTION/OFFSET
T REEL FRICTION/OFFSET
S REEL MOTOR TORQUE
T REEL MOTOR TORQUE



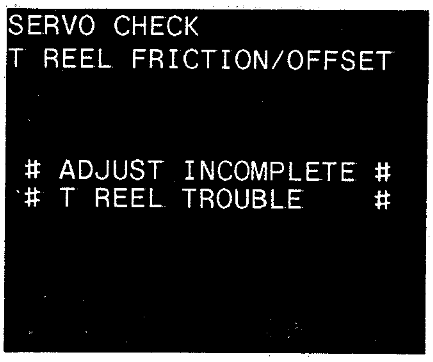
```
SERVO CHECK
S REEL FG/MOTOR CHECK


   CHECKING......
```

When all the check are performed, and all are normal, "COMPLETE" is displayed on the monitor.



```
SERVO CHECK
T REEL MOTOR TORQUE


   COMPLETE
```

In case of NG
If the contents of the trouble are displayed on the monitor, check the relative circuit of the trouble.



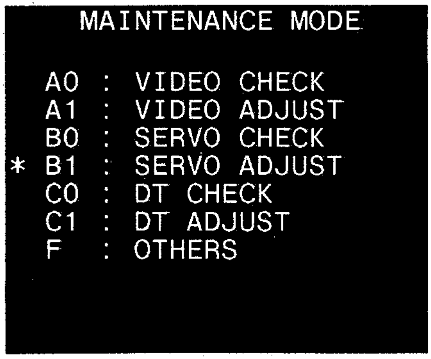
```
SERVO CHECK
T REEL FRICTION/OFFSET


 # ADJUST INCOMPLETE #
 # T REEL TROUBLE    #
```

2-21-4. Servo System Adjustment Mode (B1 : SERVO ADJUST)

Servo system is adjusted automatically or semiautomatically in this mode.

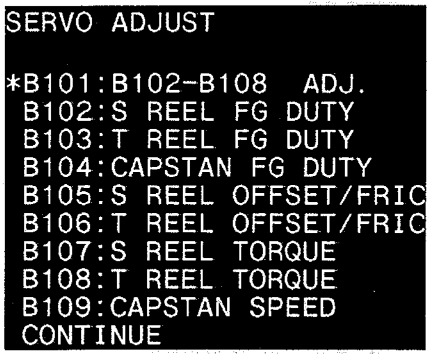
- **Procedure**

1. Turn OFF the POWER, and set S601-4 switch on the SS-48DP board to ON (CLOSE).
2. Turn ON the POWER.
3. Press the EJECT button to put the unit into the EJECT mode.
   NOTE : If the unit is not set to the EJECT mode, the servo system adjustment mode does not run.
4. Press S302 switch on the SS-48DP board.
   Then the unit enters into the maintenance mode. Modes of seven kinds are displayed on the monitor.
5. Press the search dial to put the unit into the jog mode, and move the * mark to "B1 : SERVO ADJUST" which is a mode displayed on the monitor.

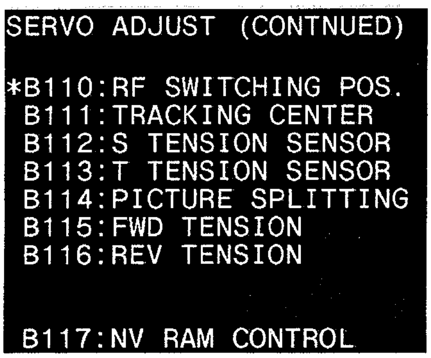


```
      MAINTENANCE MODE

   A0  :  VIDEO CHECK
   A1  :  VIDEO ADJUST
   B0  :  SERVO CHECK
*  B1  :  SERVO ADJUST
   C0  :  DT CHECK
   C1  :  DT ADJUST
   F   :  OTHERS
```

6. Press S302 switch on the SS-48DP board.
   Then "B1 : SERVO ADJUST" mode is selected, and menus are displayed on the monitor.



```
SERVO ADJUST

*B101:B102-B108  ADJ.
 B102:S REEL FG DUTY
 B103:T REEL FG DUTY
 B104:CAPSTAN FG DUTY
 B105:S REEL OFFSET/FRIC
 B106:T REEL OFFSET/FRIC
 B107:S REEL TORQUE
 B108:T REEL TORQUE
 B109:CAPSTAN SPEED
 CONTINUE
```

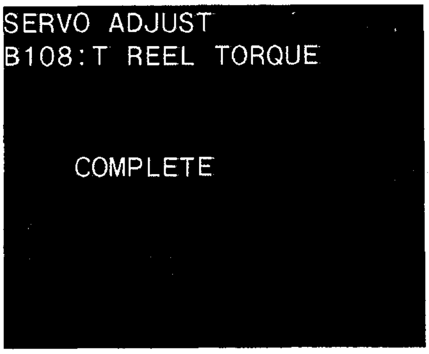


```
SERVO ADJUST (CONTNUED)

*B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION


 B117:NV RAM CONTROL
```

7. Move the * mark to a desired menu by the search dial (jog mode).
8. Press S302 switch on the SS-48DP board, and execute the * marked menu.
   (Refer to each page of menu about a method of adjustment.)
9. When all the adjustments are performed, press S303 switch on the SS-48DP board to return to the menu screen.
   NOTE : To have the NV RAM store the adjustment data after an adjustment is performed, execute the "B117 : NV RAM control".
   Also it is possible to have the NV RAM store all the adjustment data after multi adjustments are performed. At that time, execute the "B117 : NV RAM CONTROL" after all adjustments are performed.
10. If there are other menus wishing to be adjusted, repeat the step 7 to 9.
11. When all the adjustments are performed, press S303 switch on the SS-48DP board to return to the mode screen.
    NOTE : Have NV RAM store the adjustment data.
12. Turn OFF the POWER, and reset S601-4 on the SS-48DP board to OFF (OPEN).

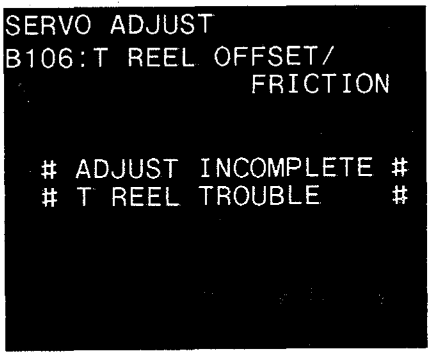
B101 : B102-B108 ADJ

Adjustments of B102 to B108 menus are performed automatically.
Confirm that adjustment is performed, and "COMPLETE" is displayed.



```
SERVO ADJUST
B108:T REEL TORQUE


    COMPLETE
```

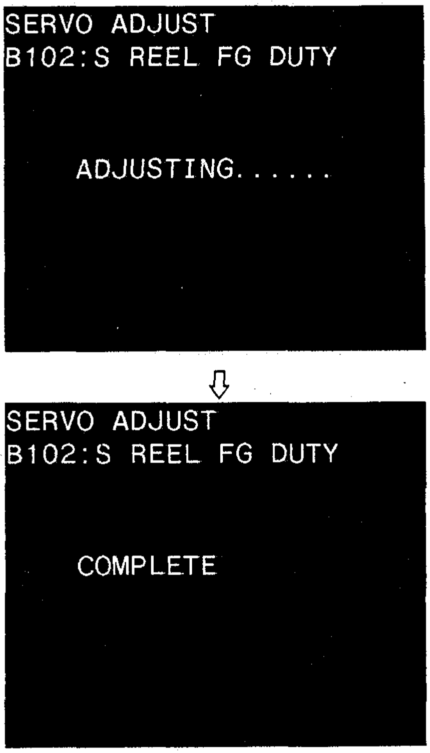
In case of NG
"ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor.
In this case, check the relative circuit of the trouble.



```
SERVO ADJUST
B106:T REEL OFFSET/
             FRICTION


  # ADJUST INCOMPLETE #
  # T REEL TROUBLE    #
```

B102 : S REEL FG DUTY

This mode adjusts the S reel FG duty.
Confirm that adjustment is performed, and "COMPLETE" is displayed.



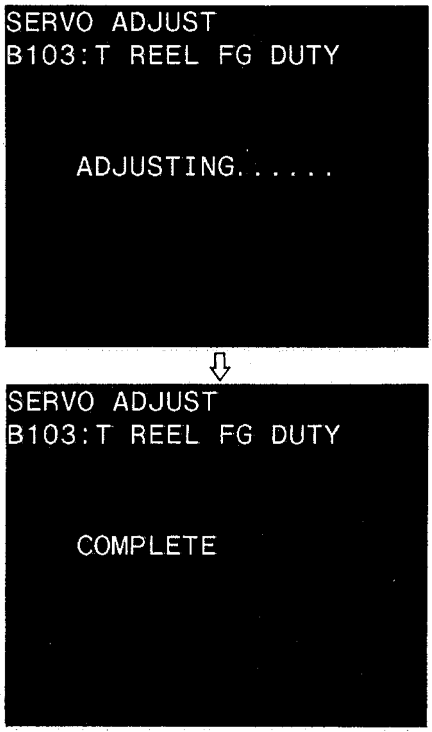
```
SERVO ADJUST
B102:S REEL FG DUTY


     ADJUSTING......
```

```
SERVO ADJUST
B102:S REEL FG DUTY


     COMPLETE
```

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, check the reel FG amplifier circuit and the reel motor driver circuit (DR-118B board and SS-48DP board).

B103 : T REEL FG DUTY

This mode adjusts the T reel FG duty.
Confirm that adjustment is performed, and "COMPLETE" is displayed.



```
SERVO ADJUST
B103:T REEL FG DUTY

    ADJUSTING......
```

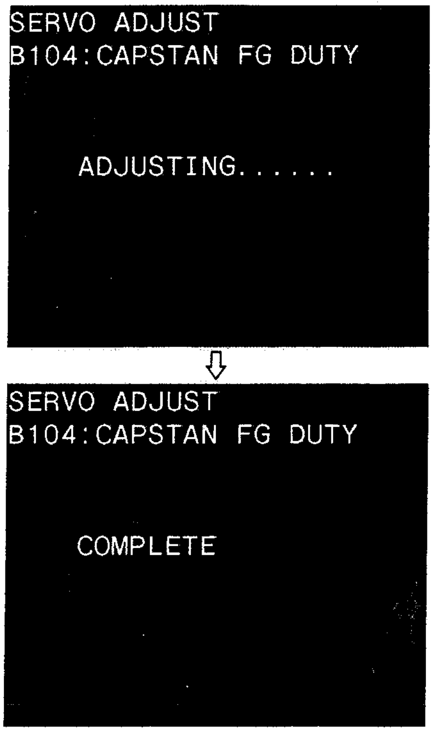
⇩

```
SERVO ADJUST
B103:T REEL FG DUTY

    COMPLETE
```

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, check the reel FG amplifier circuit and the reel motor driver circuit (DR-118B board and SS-48DP board).

B104 : CAPSTAN FG DUTY

This mode adjusts the capstan FG duty.
Confirm that adjustment is performed, and "COMPLETE" is displayed.



```
SERVO ADJUST
B104:CAPSTAN FG DUTY

    ADJUSTING......
```

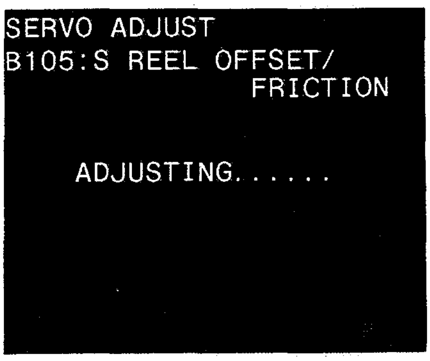
⇩

```
SERVO ADJUST
B104:CAPSTAN FG DUTY

    COMPLETE
```

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, check the capstan motor driver circuit (DR-118B board) and the capstan FG amplifier circuit (SS-48DP board).

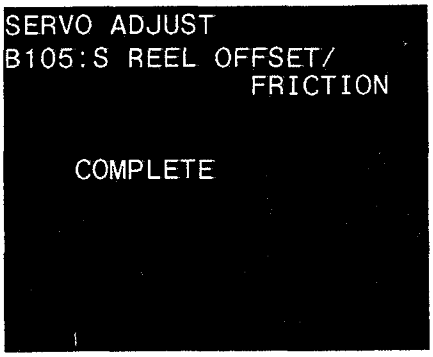
B105 : S REEL OFFSET/FRIC

This mode adjusts the S reel offset/friction.
Confirm that adjustment is performed, and "COMPLETE" is displayed.



```
SERVO ADJUST
B105:S REEL OFFSET/
              FRICTION

    ADJUSTING......
```

⇩

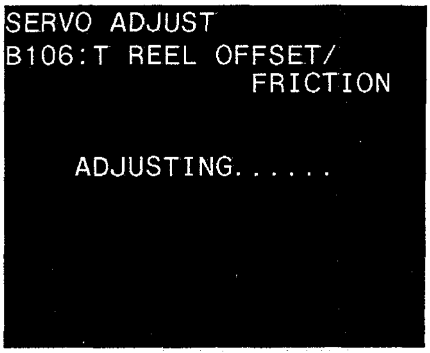


```
SERVO ADJUST
B105:S REEL OFFSET/
              FRICTION

    COMPLETE
```

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, adjust the S reel FG duty again (B102 : S REEL FG DUTY). And check the reel motor driver circuit (DR-118B board).

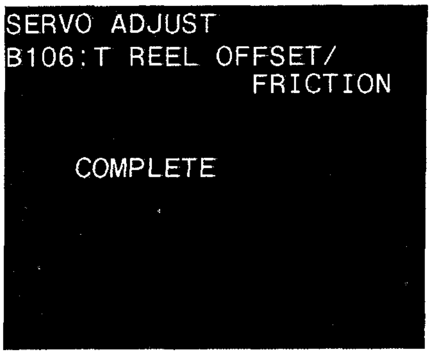
B106 : T REEL OFFSET/FRIC

This mode adjusts the T reel offset/friction. Confirm that adjustment is performed, and "COMPLETE" is displayed.



```
SERVO ADJUST
B106:T REEL OFFSET/
              FRICTION

    ADJUSTING......
```

⇩

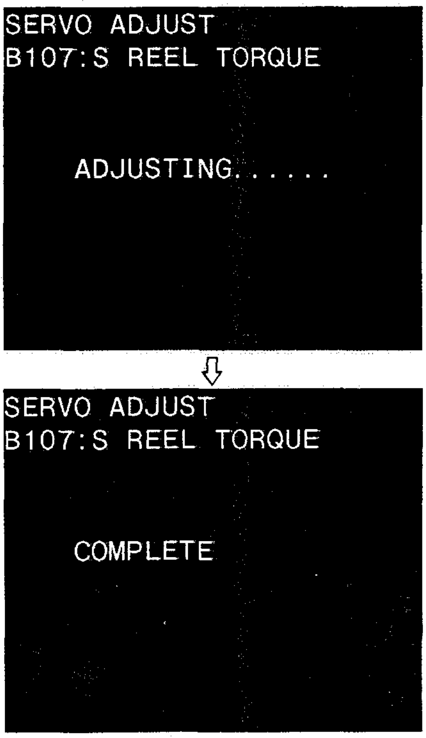


```
SERVO ADJUST
B106:T REEL OFFSET/
              FRICTION

    COMPLETE
```

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, adjust the T reel FG duty again (B103 : T REEL FG DUTY). And check the reel motor driver circuit (DR-118B board).

B107 : S REEL TORQUE

This mode adjusts the S reel torque.
Confirm that adjustment is performed and "COMPLETE" is displayed.



SERVO ADJUST
B107:S REEL TORQUE

ADJUSTING......

⇩

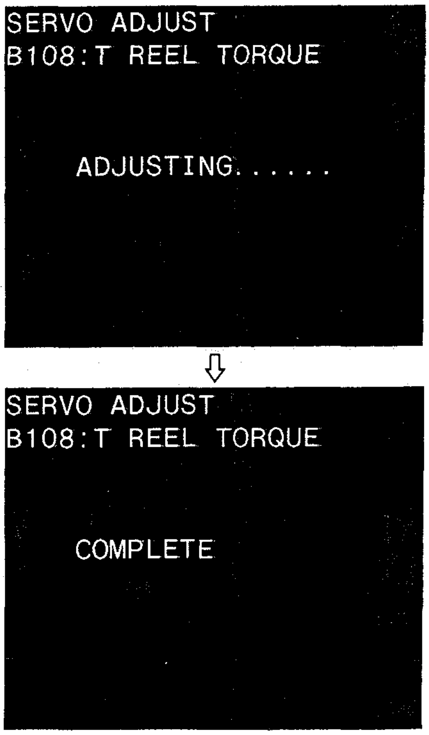
SERVO ADJUST
B107:S REEL TORQUE

COMPLETE

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, adjust the S reel FG duty again (B102 : S REEL FG DUTY). And check the reel motor driver circuit (DR-118B board).

B108 : T REEL TORQUE

This mode adjusts the T reel torque.
Confirm that adjustment is performed, and "COMPLETE" is displayed.



SERVO ADJUST
B108:T REEL TORQUE

ADJUSTING......

⇩

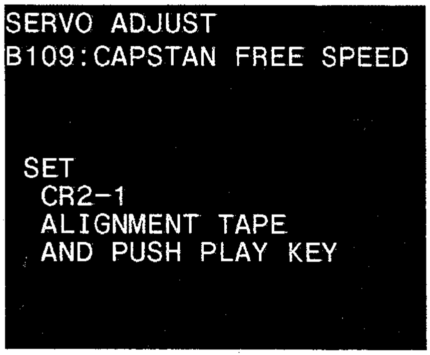
SERVO ADJUST
B108:T REEL TORQUE

COMPLETE

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, adjust the T reel FG duty again (B103 : T REEL FG DUTY). And check the reel motor driver circuit (DR-118B board).

B109 : CAPSTAN SPEED

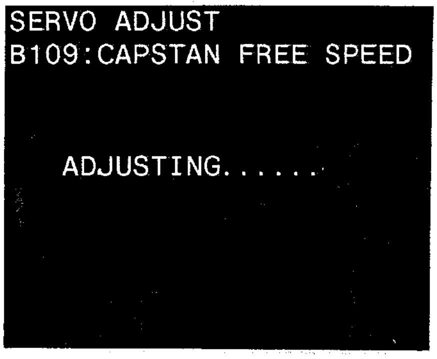
This mode adjusts the capstan free speed.



```
SERVO ADJUST
B109:CAPSTAN FREE SPEED


 SET
  CR2-1
  ALIGNMENT TAPE
  AND PUSH PLAY KEY
```

Insert an alignment tape CR2-1B PS, and press the play button.

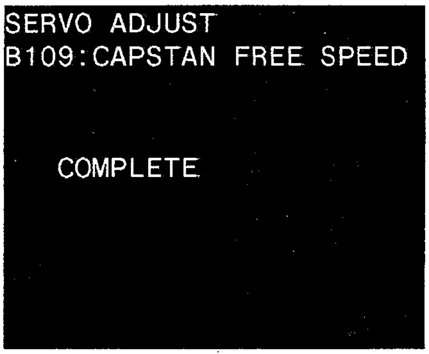
NOTE : Be sure to use an alignment tape CR2-1B PS.
It may display "COMPLETE" even after the adjustment which is playbacked by other alignment tape. But when not using the alignment tape which is regulated tape speed strictly, it is impossible to get correct adjustment data.



```
SERVO ADJUST
B109:CAPSTAN FREE SPEED


   ADJUSTING......
```

⇩

Confirm that adjustment is performed, and "COMPLETE" is displayed.
The cassette tape is ejected automatically.

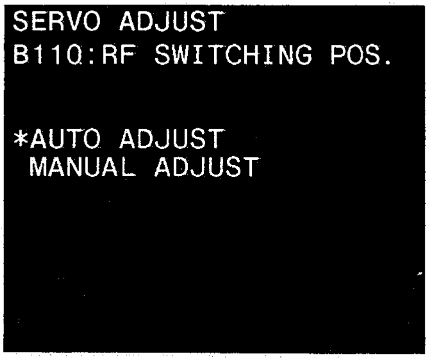


```
SERVO ADJUST
B109:CAPSTAN FREE SPEED


   COMPLETE
```

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, check the capstan FG amplifier, capstan motor drive and CTL amplifier circuit (DR-118B borad).

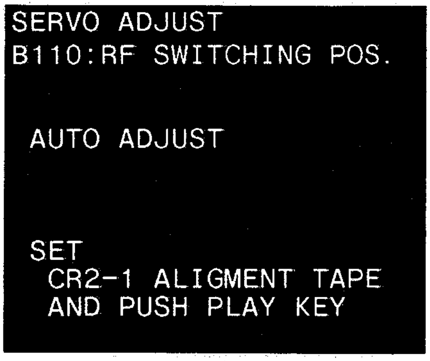
B110 : RF SWITCHING POS.

This mode adjusts the RF switching position.
Confirm that the ＊ mark is positioned to "AUTO ADJUST".



```
SERVO ADJUST
B110:RF SWITCHING POS.

*AUTO ADJUST
 MANUAL ADJUST
```

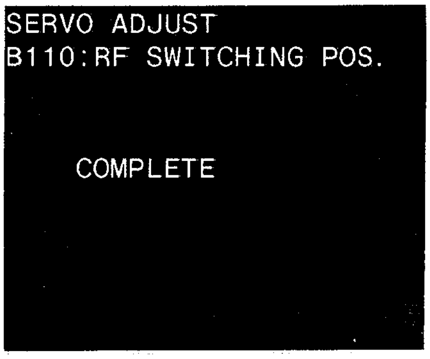
Insert an alignment tape CR2-1B PS, and press the play button.
NOTE : Be sure to use an alignment tape CR2-1B PS.
Never use other alignment tape.



```
SERVO ADJUST
B110:RF SWITCHING POS.

 AUTO ADJUST


 SET
  CR2-1 ALIGMENT TAPE
  AND PUSH PLAY KEY
```

⇩

Confirm that adjustment is performed, and "COMPLETE" is displayed.
The cassette tape is ejected automatically.

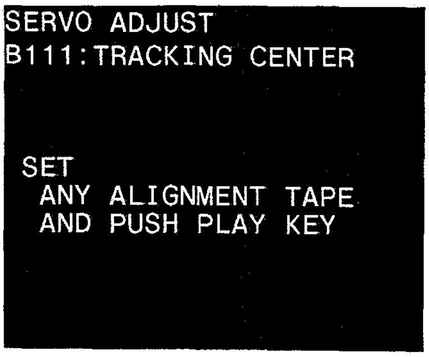


```
SERVO ADJUST
B110:RF SWITCHING POS.


    COMPLETE
```

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, check that the playbacked alignment tape was CR2-1B PS or not. And check the DO pulse circuit.

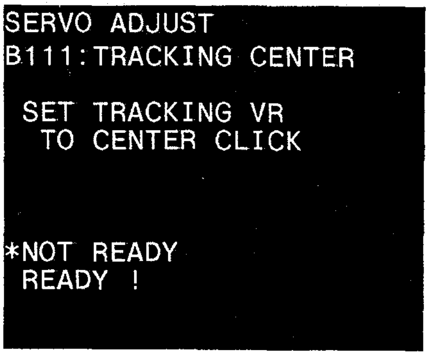
B111 : TRACKING CENTER

This mode adjusts the tracking center.



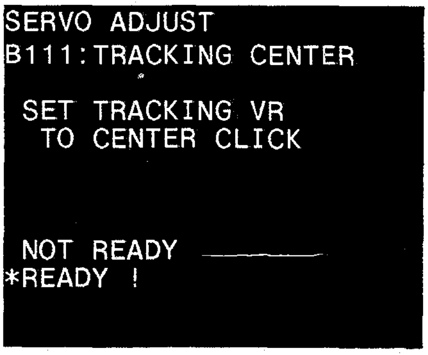
```
SERVO ADJUST
B111:TRACKING CENTER


 SET
  ANY ALIGNMENT TAPE
  AND PUSH PLAY KEY
```

1. Insert an alignment tape CR5-1B PS, and playback the color bars signal portion (14:00-17:00).



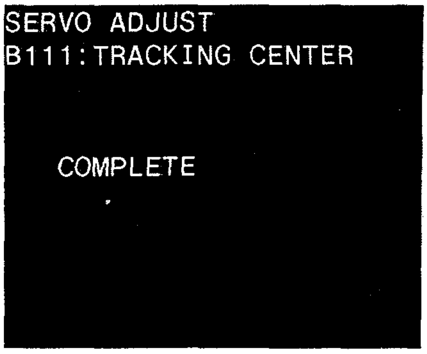
```
SERVO ADJUST
B111:TRACKING CENTER

 SET TRACKING VR
  TO CENTER CLICK


*NOT READY
 READY !
```

2. Set the TRACKING control on the control panel to FIXED.
3. Move the * mark to "READY !" on the monitor with the search dial.



```
SERVO ADJUST
B111:TRACKING CENTER

 SET TRACKING VR
  TO CENTER CLICK


 NOT READY
*READY !
```

4. Press S302 on the SS-48DP board.
5. Confirm that adjustment is performed, and "COMPLETE" is displayed.

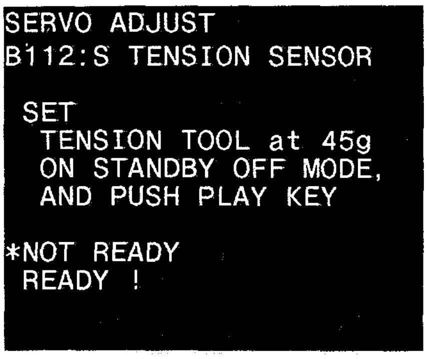


```
SERVO ADJUST
B111:TRACKING CENTER


   COMPLETE
```

In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, check the tracking volume circuit.

B112 : S TENSION SENSOR

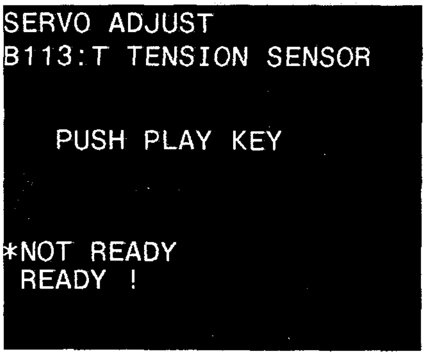
This mode adjusts the sensor of the S tension regulator.
Use fixtures in this adjustment.
Refer to section 4-19-2 about a method of adjustment.



```
SERVO ADJUST
B112:S TENSION SENSOR

 SET
  TENSION TOOL at 45g
  ON STANDBY OFF MODE,
  AND PUSH PLAY KEY

*NOT READY
 READY !
```

B113 : T TENSION SENSOR

This mode adjusts the sensor of the T tension regulator.
Use fixtures in this adjustment.
Refer to section 4-20-2 about a method of adjustment.

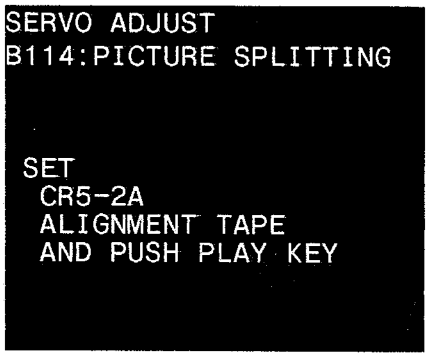


```
SERVO ADJUST
B113:T TENSION SENSOR


   PUSH PLAY KEY



*NOT READY
 READY !
```

B114 : PICTURE SPLITTING

This mode adjusts the picture splitting.

NOTE : This mode is performed only when the picture splitting is serious.

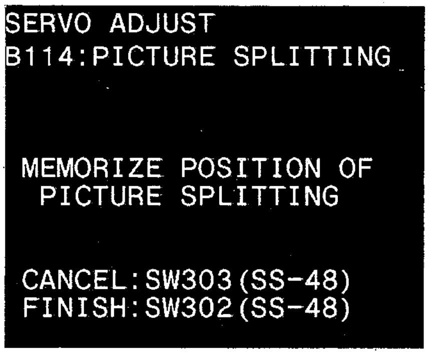


```
SERVO ADJUST
B114:PICTURE SPLITTING


 SET
  CR5-2A
  ALIGNMENT TAPE
  AND PUSH PLAY KEY
```

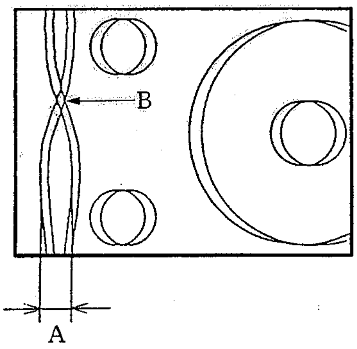
1. Connect the video monitor to TP405 (D-1) on the MDM-5P board using the BNC clip cable.
2. Set the monitor as following.
   - H DELAY
   - AFC FAST
   - INT SYNC

   Note : It is impossible to observe with the video monitor which captured the H sync strongly by the AFC circuit in the monitor.
3. Insert an alignment tape CR5-2A PS, and playback the monoscope signal portion. (13:00-15:00).
4. Measure the picture splitting portion (A portion of the figure) on the monitor.

   If the A is 1.5 μs or more (2.4 scales in H direction on the monoscope), the following steps should be performed.

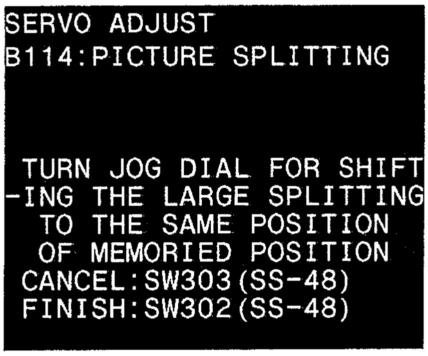


```
SERVO ADJUST
B114:PICTURE SPLITTING


 MEMORIZE POSITION OF
  PICTURE SPLITTING


 CANCEL:SW303(SS-48)
 FINISH:SW302(SS-48)
```



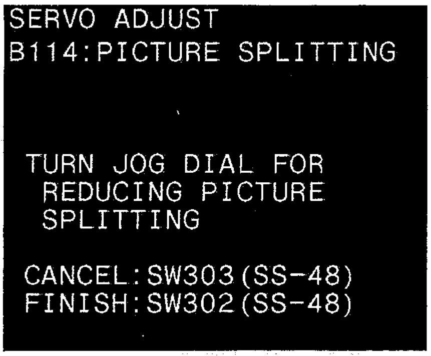
5. Memorize the closs point of the picture splitting portion (B portion of the above figure) on the monitor, and press S302 on the SS-48DP board.

   NOTE : It is easy to memorize by putting a adhesive tape on the monitor.



```
SERVO ADJUST
B114:PICTURE SPLITTING


 TURN JOG DIAL FOR SHIFT
-ING THE LARGE SPLITTING
  TO THE SAME POSITION
  OF MEMORIED POSITION
 CANCEL:SW303(SS-48)
 FINISH:SW302(SS-48)
```

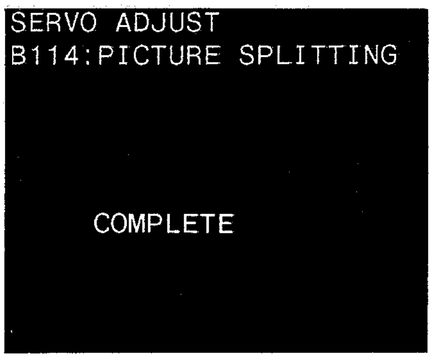
6. Turn the search dial, and position the closs point at the memorized position in step 5, and press S302 on the SS-48DP board.
7. Turn the search dial to make least the picture splitting, and press S302 on the SS-48DP board.



```
SERVO ADJUST
B114:PICTURE SPLITTING


 TURN JOG DIAL FOR
  REDUCING PICTURE
  SPLITTING

 CANCEL:SW303(SS-48)
 FINISH:SW302(SS-48)
```

8. Cofirm that adjustment is performed, and "COMPLETE" is displayed.

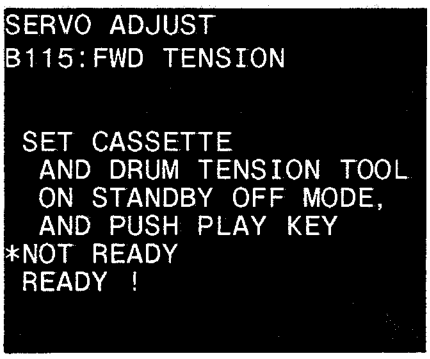
In case of NG
If "ADJUST INCOMPLETE" and contents of the trouble are displayed on the monitor, check the drum FG amplifier circuit and drum motor drive circuit.



```
SERVO ADJUST
B114:PICTURE SPLITTING



     COMPLETE
```

B115 : FWD TENSION

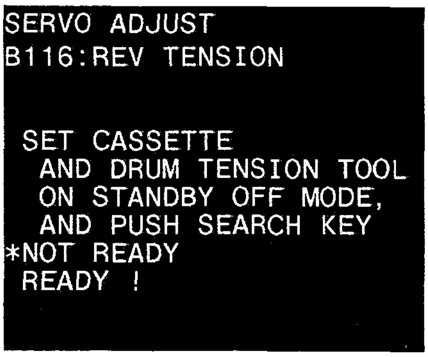
This mode adjusts the FWD back tension.
Use fixtures in this adjustment.
Refer to section 4-19-3 about a method of adjustment.



```
SERVO ADJUST
B115:FWD TENSION


 SET CASSETTE
  AND DRUM TENSION TOOL
  ON STANDBY OFF MODE,
  AND PUSH PLAY KEY
*NOT READY
 READY !
```

B116 : REV TENSION

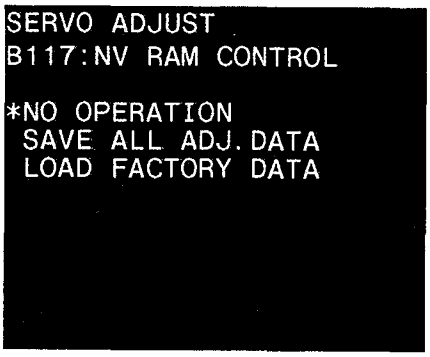
This mode adjusts the REV back tension.
Use fixtures in this adjustment.
Refer to section 4-19-4 about a methed of adjustment.



```
SERVO ADJUST
B116:REV TENSION

 SET CASSETTE
  AND DRUM TENSION TOOL
  ON STANDBY OFF MODE,
  AND PUSH SEARCH KEY
*NOT READY
 READY !
```

B117 : NV RAM CONTROL

This mode stores the adjustment data to NVRAM.



```
SERVO ADJUST
B117:NV RAM CONTROL

*NO OPERATION
 SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

When having all the adjustment data stored
Move the * mark to "SAVE ALL ADJ. DATA" with the search dial, and press S302 switch on the SS-48DP board.

When returning all the adjustmented data to the condition that the unit is shipped from the factory
Move the * mark to "LOAD FACTORY DATA" with the search dial, and press S302 switch on the SS-48DP board.

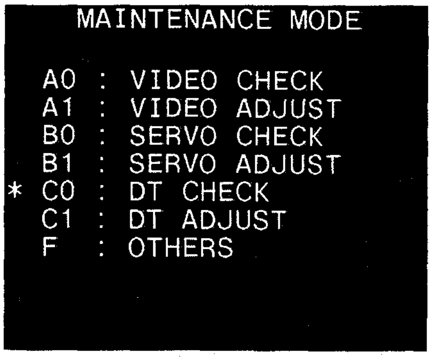
"SAVE COMPLETE" is displayed on the monitor after the data is stored.
After "SAVE COMPLETE" was displayed, press S303 on the SS-48DP board to return to the menu screen. Or press S303 twice to return to the mode screen.

2-21-5. DT System Check Mode (C0 : DT CHECK)

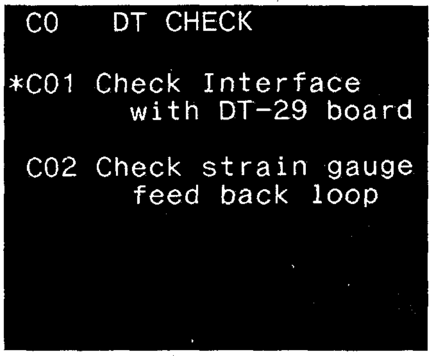
DT System is checked automatically in this mode.

• Procedure

1. Turn OFF the POWER, and set S601-4 switch on SS-48D board to ON (CLOSE).
2. Turn ON the POWER.
3. Press the EJECT button to put the unit into the EJECT mode.
4. Press S302 switch on SS-48D board.
   Then the unit enters into the maintenance mode. Modes of seven kinds are displayed on the monitor.
5. Press the search dial to put the unit into the jog mode, and move * mark to "C0 : DT CHECK" which is a mode displayed on the monitor.



```
  MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
  B0 : SERVO CHECK
  B1 : SERVO ADJUST
* C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```



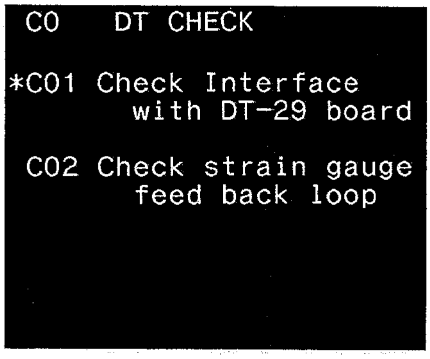
```
 C0    DT CHECK

*C01  Check Interface
        with DT-29 board

 C02  Check strain gauge
        feed back loop
```

6. Press S302 switch on SS-48D board.
   Then "C0 : DT CHECK" mode is selected, and menus are displayed on the monitor.
7. Move * mark to a desired menu by the search dial (jog mode).
8. Press S302 switch on SS-48D board, and execute the * marked menu.
9. After confirming the "* Start checking" is displayed on the monitor, press S302 switch on SS-48D board.
   Then checking starts.
10. When check is finished, press S303 switch on SS-48D board to return to the submenu screen. Or, press switch S303 twice to return to the menu screen.
11. If there are other menus or submenus wishing to be checked, repeat the steps 7 to 10.
12. When all the checks are performed, press S303 switch on SS-48D board twice to return to the mode screen.
13. When closing the maintenance mode, press S303 on SS-48D board. Next, turn OFF the POWER, and reset S601-4 switch on SS-48D board to OFF (OPEN).

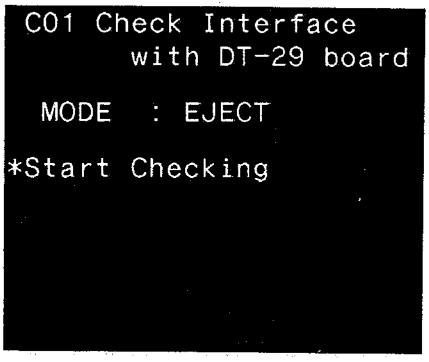
C01 : Check Interface with DT-29 board

Check the interface with DT-29 board.
After displaying "＊Start Checking", press S302 on SS-48DP board.

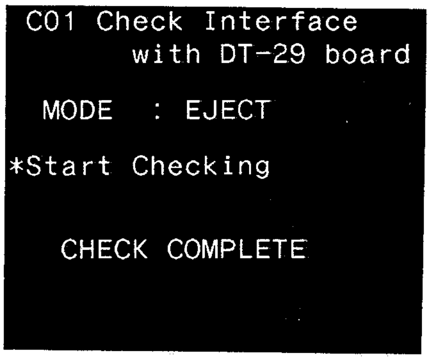
In case of NG
If "CHECK COMPLETE" is not displayed on the moniton screen, check the interface with DT-29 board.



```
CO    DT CHECK

*C01 Check Interface
         with DT-29 board

 C02 Check strain gauge
          feed back loop
```



```
 C01 Check Interface
         with DT-29 board

  MODE   : EJECT

*Start Checking
```

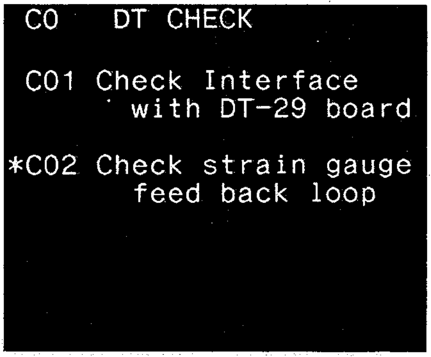


```
 C01 Check Interface
         with DT-29 board

  MODE   : EJECT

*Start Checking

   CHECK COMPLETE
```

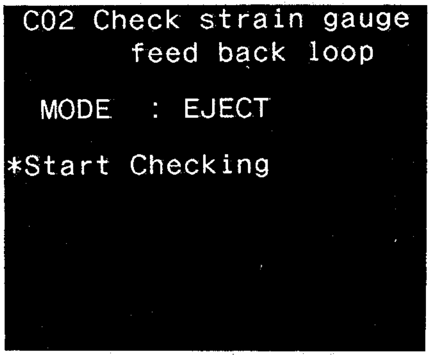
C02 : Check strain gauge feed back loop

Check the feed back loop between bimorph drive circuit amplifier on DT-28 board and bimorph strain/gauge on DT-29 board operates normally or not.

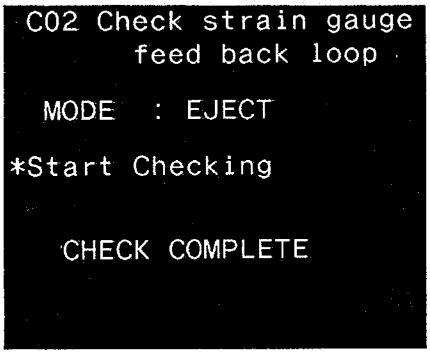
In case of NG
If "CHECK COMPLETE" is not displayed on the moniton screen, check the feed back system.



```
 CO   DT CHECK

 C01 Check Interface
       with DT-29 board

*C02 Check strain gauge
       feed back loop
```



```
 C02 Check strain gauge
       feed back loop

  MODE   : EJECT

*Start Checking
```



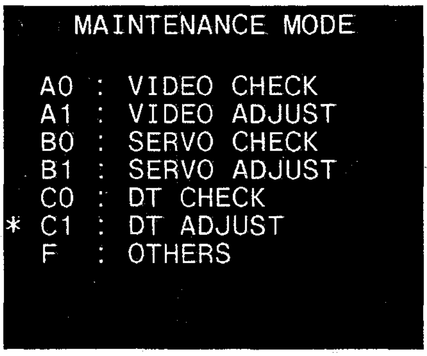
```
 C02 Check strain gauge
       feed back loop

  MODE   : EJECT

*Start Checking

    CHECK COMPLETE
```

2-21-6. DT System Adjustment Mode (C1 : DT ADJUST)

DT System is adjusted automatically or semiautomatically in this mode.

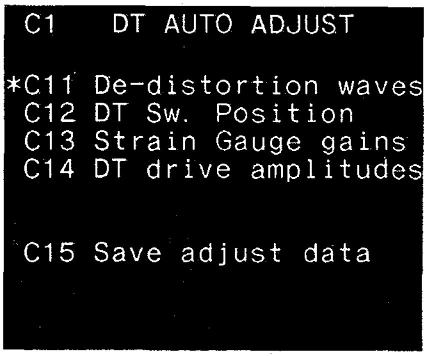
- **Procedure**

1. Turn OFF the POWER, and set S2-1, -2, -5 switches on DT-28 board to ON (CLOSE).
2. Turn ON the POWER.
3. Press the EJECT button to put the unit into the EJECT mode.
4. Press S302 switch on SS-48DP board.
   Then the unit enters into the maintenance mode. Modes of seven kinds are displayed on the monitor.
5. Press the search dial to put the unit into the jog mode, and move * mark to "C1 : DT ADJUST" which is a mode displayed on the monitor.



```
     MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
  B0 : SERVO CHECK
  B1 : SERVO ADJUST
  C0 : DT CHECK
* C1 : DT ADJUST
  F  : OTHERS
```

6. Press S302 switch on SS-48DP board.
   Then "C1 : DT ADJUST" mode is selected, and menus are displayed on the monitor.



```
 C1    DT AUTO ADJUST

*C11 De-distortion waves
 C12 DT Sw. Position
 C13 Strain Gauge gains
 C14 DT drive amplitudes


 C15 Save adjust data
```

7. Move * mark to a desired menu by the search dial (jog mode).
8. Press S302 switch on SS-48DP board, and execute the * marked menu.
9. When the adjustment is completed, press S303 switch on SS-48DP board to return to the menu screen.

   Note : To have the NV RAM store the adjustment data after an adjustment is performed, execute the "C15 : Save adjust data".

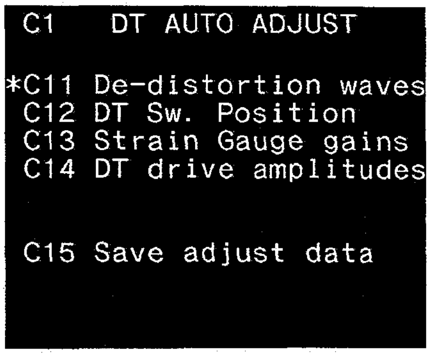
   Also it is possible to have the NV RAM store all the adjustment data after multi adjustments are performed. At that time, execute the "C15 : Save adjust data" after all adjustments are performed.
10. If there are other menus or submenus wishing to be adjusted, repeat the steps 7 to 9.
11. When all the adjustments are performed, press S303 switch on SS-48DP board twice to return to the mode screen.

    Note : Have NV RAM store the adjustment data.
12. Turn OFF the POWER, and reset S2-1, -2, -5 switches on DT-28 board to OFF (OPEN).

C11 : De-distortion waves

Before performing this adjustment, perform the "De-distortion waveform adjustment" according to electrical adjustment.

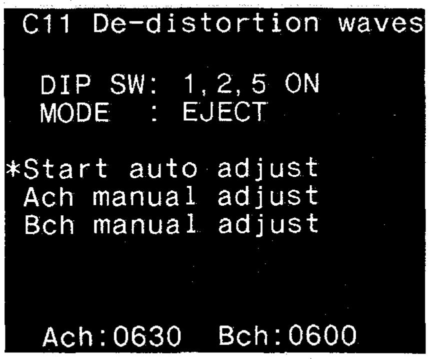
(1) Press S302 switch on SS-48DP board, and execute "C11 : De-distortion waves".



```
 C1    DT AUTO ADJUST

*C11 De-distortion waves
 C12 DT Sw. Position
 C13 Strain Gauge gains
 C14 DT drive amplitudes


 C15 Save adjust data
```

(2) After confirming the "∗ Start auto adjust" is displayed on the monitor, press S302 switch on SS-48DP board.

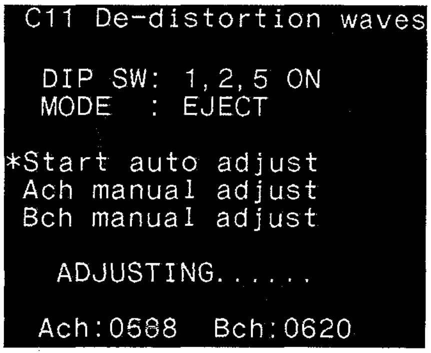
(3) When the adjustment is completed, press S303 switch on SS-48DP board to return to the menu screen.



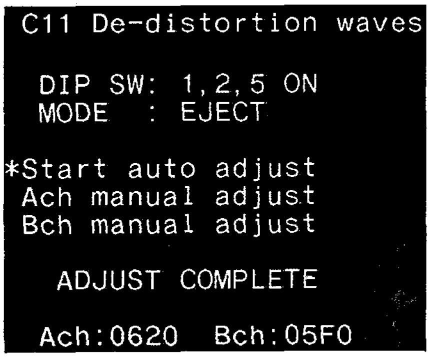
```
 C11 De-distortion waves

  DIP SW:  1,2,5 ON
  MODE   :  EJECT

*Start auto adjust
 Ach manual adjust
 Bch manual adjust



  Ach:0630   Bch:0600
```

In case of NG

If "ADJUST INCOMPLETE" is displayed on the monitor, perform the manual adjustment according to the electrical adjustment.



```
 C11 De-distortion waves

  DIP SW:  1,2,5 ON
  MODE   :  EJECT

*Start auto adjust
 Ach manual adjust
 Bch manual adjust

   ADJUSTING......

  Ach:0588   Bch:0620
```

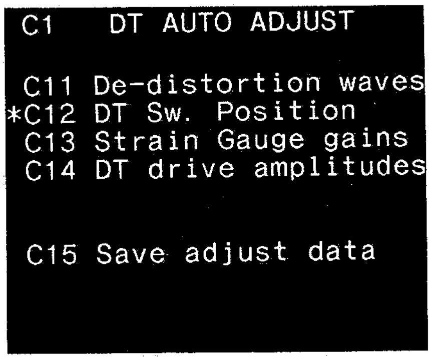


```
 C11 De-distortion waves

  DIP SW:  1,2,5 ON
  MODE   :  EJECT

*Start auto adjust
 Ach manual adjust
 Bch manual adjust

   ADJUST COMPLETE

  Ach:0620   Bch:05F0
```

C12 : DT Sw. Position

This mode adjusts the DT head switching position.

(1) Press S302 switch on SS-48DP board, and execute “C12 : DT Sw. Position”.



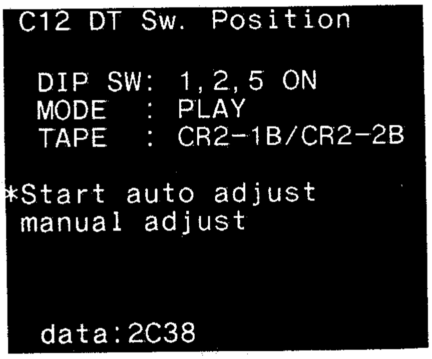
```
C1    DT AUTO ADJUST

 C11 De-distortion waves
*C12 DT Sw. Position
 C13 Strain Gauge gains
 C14 DT drive amplitudes

 C15 Save adjust data
```

(2) Insert an alignment tape CR2-1B PS.

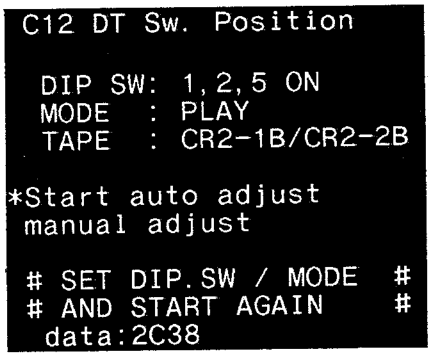
(3) After confirming the “ * Start auto adjust” is displayed on the monitor, press S302 switch on SS-48DP board.

(4) Press the PLAY button.

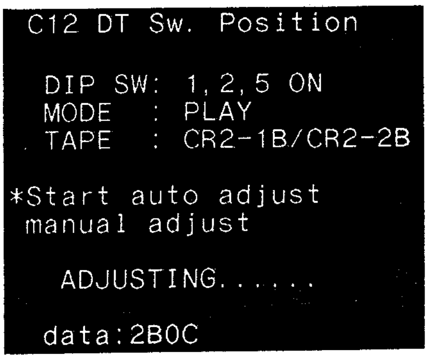
(5) Press S302 switch on SS-48DP board again.



```
C12 DT Sw. Position

 DIP SW: 1,2,5 ON
 MODE  : PLAY
 TAPE  : CR2-1B/CR2-2B

*Start auto adjust
 manual adjust


  data:2C38
```



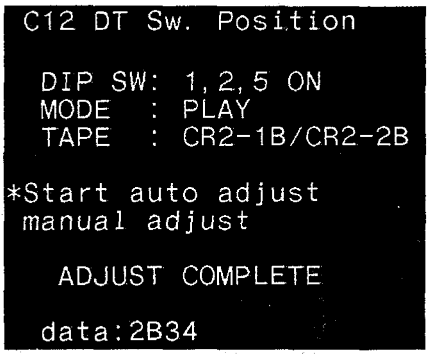
```
C12 DT Sw. Position

 DIP SW: 1,2,5 ON
 MODE  : PLAY
 TAPE  : CR2-1B/CR2-2B

*Start auto adjust
 manual adjust

 # SET DIP.SW / MODE  #
 # AND START AGAIN    #
  data:2C38
```



```
C12 DT Sw. Position

 DIP SW: 1,2,5 ON
 MODE  : PLAY
 TAPE  : CR2-1B/CR2-2B

*Start auto adjust
 manual adjust

   ADJUSTING......

  data:2B0C
```

(6) When the adjustment is completed, press the EJECT button, and take out the alignment tape CR2-1B PS.

(7) Press S303 switch on SS-48DP board to return to the menu screen.



```
 C12 DT Sw. Position

  DIP SW:  1,2,5 ON
  MODE   :  PLAY
  TAPE   :  CR2-1B/CR2-2B

*Start auto adjust
 manual adjust

   ADJUST COMPLETE

  data:2B34
```

In case of NG

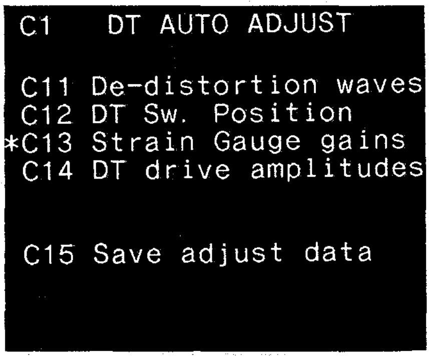
If "ADJUST INCOMPLETE" is displayed on the monitor, perform the manual adjustment according to the electrical adjustment.

C13 : Strain Gauge gains

This mode adjusts the gain of the strain gauge for DT head.

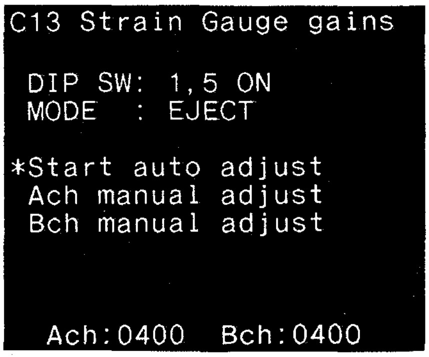
Note : In this adjustment, set S2-1 and S2-5 switches on DT-28 board to ON (CLOSE). Never set S2-2 switch to ON (CLOSE).

(1) Press S302 switch on SS-48DP board, and execute "C13 : Strain Gauge gains".

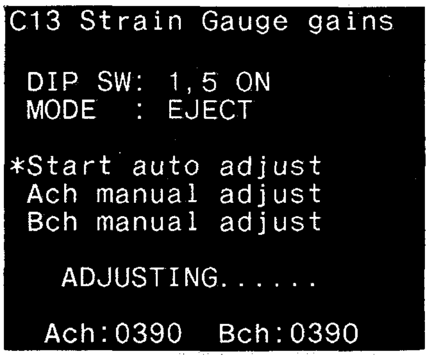


```
C1    DT AUTO ADJUST

 C11 De-distortion waves
 C12 DT Sw. Position
*C13 Strain Gauge gains
 C14 DT drive amplitudes


 C15 Save adjust data
```

(2) After confirming the " * Start auto adjust" is displayed on the monitor, press S302 switch on SS-48DP board.



```
C13 Strain Gauge gains

 DIP SW:  1,5 ON
 MODE   : EJECT

*Start auto adjust
 Ach manual adjust
 Bch manual adjust



  Ach:0400   Bch:0400
```



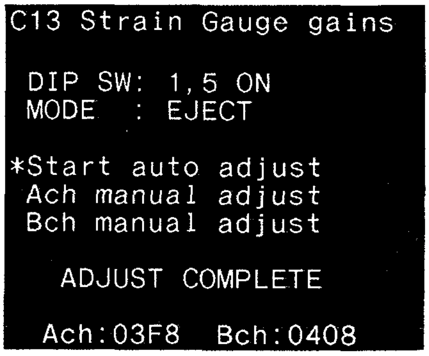
```
C13 Strain Gauge gains

 DIP SW:  1,5 ON
 MODE   : EJECT

*Start auto adjust
 Ach manual adjust
 Bch manual adjust

   ADJUSTING......

  Ach:0390   Bch:0390
```

(3) When the adjustment is completed, press S303 switch on SS-48DP board to return to the menu screen.

In case of NG

If "ADJUST INCOMPLETE" is displayed on the monitor, perform the manual adjustment according to the electrical adjustment.

Note : Adjustment of "C14 : DT drive amplitudes" must be performed after adjusting "C13 : Strain Gauge gains". (As the adjustment of C13 returns the adjustment data of C14 to the initial data.)



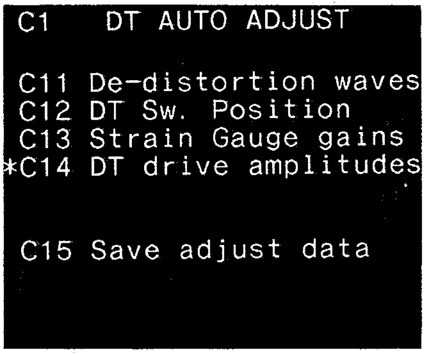
```
C13 Strain Gauge gains

 DIP SW:  1,5 ON
 MODE   : EJECT

*Start auto adjust
 Ach manual adjust
 Bch manual adjust

   ADJUST COMPLETE

  Ach:03F8   Bch:0408
```

C14 : DT drive amplitudes

This mode adjusts the DT head drive amplifier.

Note : In this adjustment, set S2-1 and S2-5 switches on DT-28 board to ON (CLOSE). Never set S2-2 switch to ON (CLOSE).

(1) Press S302 switch on SS-48D board, and execute "C14 : DT drive amplitudes".



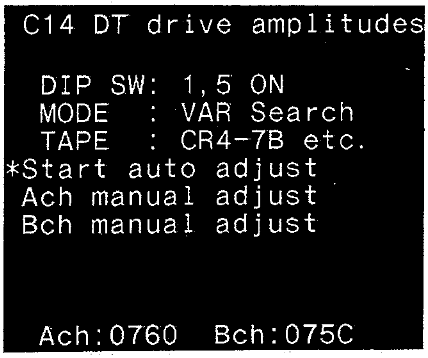
```
C1    DT AUTO ADJUST

C11 De-distortion waves
C12 DT Sw. Position
C13 Strain Gauge gains
*C14 DT drive amplitudes


C15 Save adjust data
```

(2) Set the DT SELECT switch to SRC.

(3) Press the search dial to put the unit into the shuttle mode.

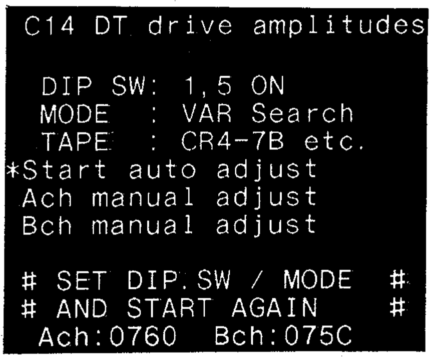
(4) Insert the color bars signal portion of an alignment tape CR5-1B PS to the unit.

(5) After confirming the " * Start auto adjust" is displayed on the monitor, press S302 switch on SS-48DP board.



```
C14 DT drive amplitudes

 DIP SW: 1,5 ON
 MODE  : VAR Search
 TAPE  : CR4-7B etc.
*Start auto adjust
 Ach manual adjust
 Bch manual adjust



 Ach:0760  Bch:075C
```

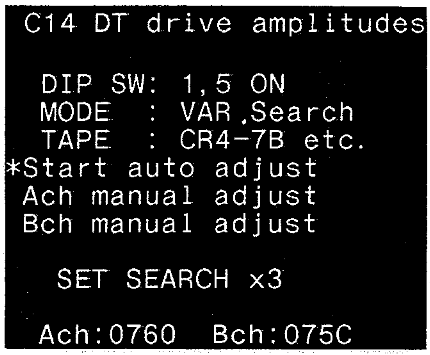
(6) Turn the search dial to clockwise direction so that the * mark places to "Ach manual adjust". After that, turn the search dial to counterclockwise direction, and moves the * mark to "* Start auto adjust" again.



```
C14 DT drive amplitudes

 DIP SW: 1,5 ON
 MODE  : VAR Search
 TAPE  : CR4-7B etc.
*Start auto adjust
 Ach manual adjust
 Bch manual adjust

# SET DIP.SW / MODE  #
# AND START AGAIN    #
 Ach:0760  Bch:075C
```

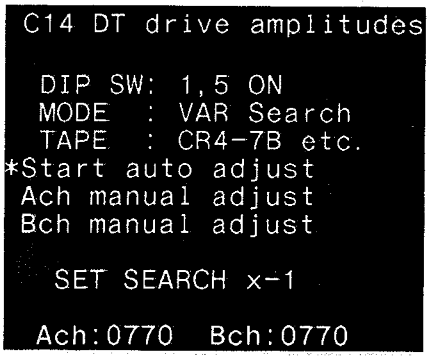
(7) Press S302 switch on SS-48DP board.

(8) Turn the search dial very slowly to clockwise direction until the data of Ach and Bch start to changing which is displayed at the lower portion on the monitor screen.

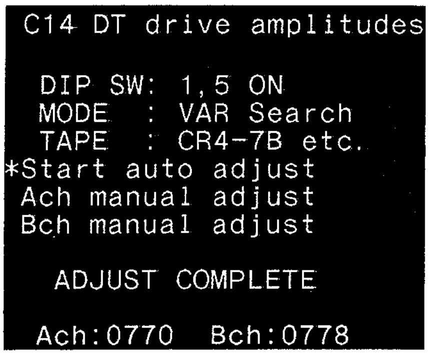


```
C14 DT drive amplitudes

 DIP SW: 1,5 ON
 MODE  : VAR,Search
 TAPE  : CR4-7B etc.
*Start auto adjust
 Ach manual adjust
 Bch manual adjust

  SET SEARCH x3

 Ach:0760  Bch:075C
```

(9) After "SET SEARCH ×-1" is displayed on the monitor, turn the search dial very slowly to counterclockwise direction until the data of Ach and Bch start to changing which is displayed at the lower portion on the monitor screen.



```
C14 DT drive amplitudes

 DIP SW: 1,5 ON
 MODE  : VAR Search
 TAPE  : CR4-7B etc.
*Start auto adjust
 Ach manual adjust
 Bch manual adjust

  SET SEARCH x-1

 Ach:0770  Bch:0770
```



```
C14 DT drive amplitudes

 DIP SW: 1,5 ON
 MODE  : VAR Search
 TAPE  : CR4-7B etc.
*Start auto adjust
 Ach manual adjust
 Bch manual adjust

  ADJUST COMPLETE

 Ach:0770  Bch:0778
```

(10) When the adjustment is completed, press S303 switch on SS-48DP board three times to exits the maintenance mode. Press the EJECT button to ejecting the alignment tape.

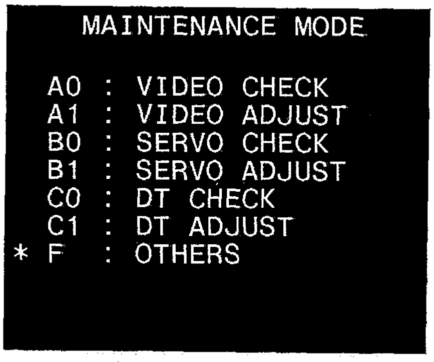
In case of NG
If "ADJUST INCOMPLETE" is displayed on the monitor, perform the manual adjustment according to the electrical adjustment.

2-21-7. Other Check Mode (F : OTHERS)

In this mode, it is able to check the ROM version, switch of the control panel/sub control panel and CF data.

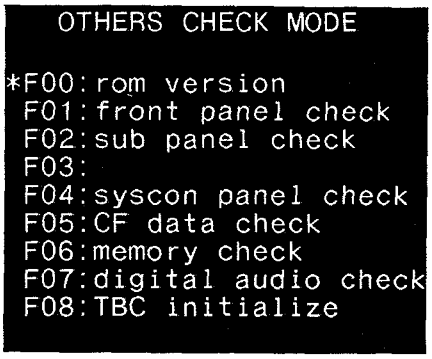
• Procedure

1. Press S302 switch on the SS-48DP board.
   Then the unit enters into the maintenance mode.
   Modes of seven kinds are displayed on the monitor.
2. Press the search dial to put the unit into the jog mode, and move the * mark to "F : OTHERS" which is a mode displayed on the monitor.



```
   MAINTENANCE MODE

 A0 : VIDEO CHECK
 A1 : VIDEO ADJUST
 B0 : SERVO CHECK
 B1 : SERVO ADJUST
 C0 : DT CHECK
 C1 : DT ADJUST
* F  : OTHERS
```

3. Press S302 switch on the SS-48DP board.
   Then "F : OTHERS" mode is selected, and menus are displayed on the monitor.



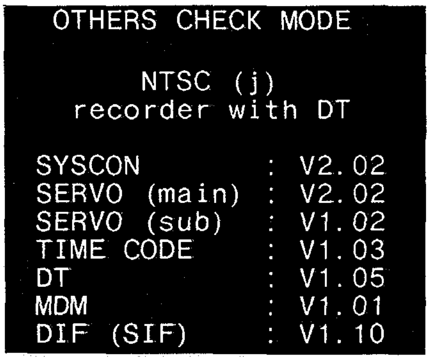
```
  OTHERS CHECK MODE

*F00:rom version
 F01:front panel check
 F02:sub panel check
 F03:
 F04:syscon panel check
 F05:CF data check
 F06:memory check
 F07:digital audio check
 F08:TBC initialize
```

4. Move the * mark to a desired menu with the search dial (jog mode).
5. Press S302 switch on the SS-48DP board, and execute the * marked menu.
6. When check is performed, press S303 switch on the SS-48DP board to return to the menu screen.
7. If there are other menus wishing to be checked, repeat the steps 4 to 6.
8. When all the checks are performed, press S303 switch on the SS-48DP board to return to the mode picture.

F00 : rom version

In this mode, ROM versions are displayed.

SYSCON : IC7 on the SS-48DP board
SERVO (main) : IC607 on the SS-48DP board
SERVO (sub) : IC710 on the SS-48DP board
TIME CODE : IC403 on the SS-48DP board
DT : IC10 on the DT-28 board
MDM : IC902 on the MDM-5P board
DIF (SIF) : IC310 on the SIF-17 board

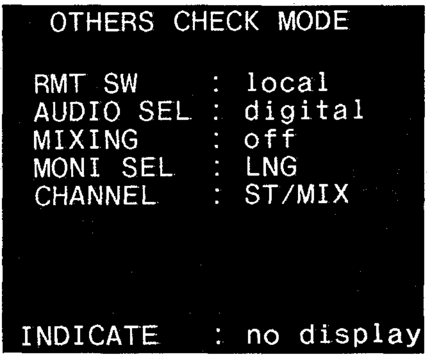


```
 OTHERS CHECK MODE

      NTSC (j)
   recorder with DT

SYSCON         : V2.02
SERVO (main)   : V2.02
SERVO (sub)    : V1.02
TIME CODE      : V1.03
DT             : V1.05
MDM            : V1.01
DIF (SIF)      : V1.10
```

F01 : front panel check

This mode checks the function of the switches which are on the control panel.

RMT SW : Operate the LOCAL/REMOTE switch, and confirm that the monitor display changes to the set position.
AUDIO SEL : Operate the AUDIO INPUT SELECT switch, and confirm that the monitor display changes to the set position.
MIXING : Operate the AUDIO MIXING switch, and confirm that the monitor display changes to the set position.
MONI SEL : Operate the AUDIO MONITOR switch, and confirm that the monitor display changes to the set position (AFM or LNG).
CHANNEL : Operate the AUDIO MONITOR switch, and confirm that the monitor display changes to the set position (CH-1/3, ST, CH-2/4).



```
 OTHERS CHECK MODE

RMT SW     : local
AUDIO SEL  : digital
MIXING     : off
MONI SEL   : LNG
CHANNEL    : ST/MIX



INDICATE    : no display
```

F02 : sub panel check

This mode checks the function of the switches which are on the sub control panel.

CAP LOCK : Operate the CAPSTAN LOCK switch, and confirm that the monitor display changes to the set position.

TC : Operate the TC EXT/INT switch, and confirm that the monitor display changes to the set position.

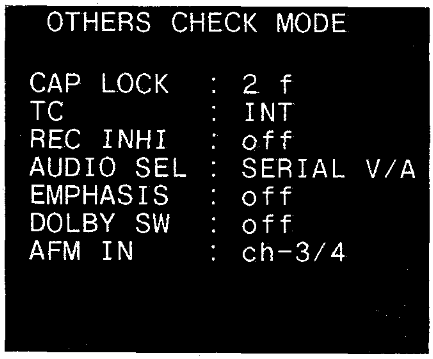
REC INHI : Operate the REC INHIBIT switch, and confirm that the monitor display changes to the set position.

AUDIO SEL : Operate the DIGITAL AUDIO INPUT switch, and confirm that the monitor display changes to the set position.

EMPHASIS : Operate the DIGITAL AUDIO EMPHASIS switch, and confirm that the monitor display changes to the set position.

DOLBY SW : Operate the DOLBY NR switch, and confirm that the monitor display changes to the set position.

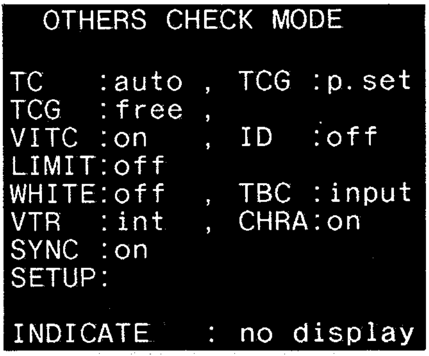
AFM IN : Operate the AFM INPUT switch, and confirm that the monitor display changes to the set position.



```
 OTHERS CHECK MODE

CAP LOCK   : 2 f
TC         : INT
REC INHI   : off
AUDIO SEL  : SERIAL V/A
EMPHASIS   : off
DOLBY SW   : off
AFM IN     : ch-3/4
```

F04 : syscon panel check

This mode checks the function of the switches which are on the system control panel.



```
 OTHERS CHECK MODE

TC    :auto , TCG :p.set
TCG   :free ,
VITC :on    , ID   :off
LIMIT:off
WHITE:off   , TBC :input
VTR   :int  , CHRA:on
SYNC :on
SETUP:

INDICATE   : no display
```

TC : Operate the time code selector, and confirm that the monitor display changes to the set position.

TCG : Operate the REGEN/PRESET switch of the TC GENERATOR, and confirm that the monitor display changes to the set position.

TCG : Operate the REC RUN/FREE RUN switch of the TC GENERATOR, and confirm that the monitor display changes to the set position.

VITC : Operate the VITC switch, and confirm that the monitor display changes to the set position.

ID : Operate the ID PRESET switch, and confirm that the monitor display changes to the set position.

LIMIT : Operate the AUDIO LIMIT switch, and confirm that the monitor display changes to the set position.

WHITE : Operate the LEVEL REF switch, and confirm that the monitor display changes to the set position.

TBC : Operate the TBC REF switch, and confirm that the monitor display changes to the set position.

VTR : Operate the VTR CONTROL switch, and confirm that the monitor display changes to the set position.

CHRA : Operate the CHARACTER switch, and confirm that the monitor display changes to the set position.

SYNC : Operate the SYNCHRONIZE switch, and confirm that the monitor display changes to the set position.

SETUP : Push the SYSTEM SET-UP button, and confirm that the monitor display changes to the pushed mode.

F05 : CF data check

REF ID : The field number for reference TBC is displayed.

INPUT ID : The field number of input video signal is displayed, and the difference between the field number and REF ID is displayed. (field number : 0 through 3)

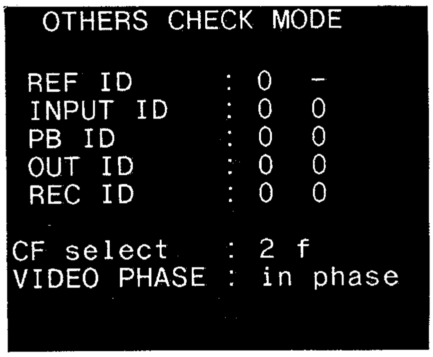
PB ID : The field number of play back video signal in play back mode is displayed, and the difference between the field number and REF ID is displayed. (field number : 0 through 3)

OUT ID : The field number of the output signal from the VTR is displayed, and the difference between the field number and REF ID is displayed. (field number : 0 through 3)

REC ID : The field number of CF ID recorded on the tape in REC mode is displayed, and the difference between the field number and REF ID is displayed. (field number : 0 through 3)

CF select : The CF select of the VTR is displayed.

VIDEO PHASE : Whether the video phase by CF ID is IN phase or OUT phase is displayed.



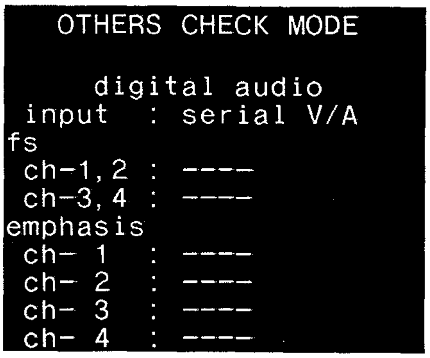
```
 OTHERS CHECK MODE

REF ID       : 0  -
INPUT ID     : 0  0
PB ID        : 0  0
OUT ID       : 0  0
REC ID       : 0  0

CF select    : 2 f
VIDEO PHASE  : in phase
```

F06 : memory check

factory use

F07 : digital audio check

This mode displays fs and pre-emphasis code information of input digital audio signal which is entered from SERIAL V/A INPUT and DIGITAL AUDIO INPUT connectors.



```
      OTHERS CHECK MODE

          digital audio
 input   : serial V/A
fs
 ch-1,2  : ----
 ch-3,4  : ----
emphasis
 ch- 1   : ----
 ch- 2   : ----
 ch- 3   : ----
 ch- 4   : ----
```

input : Operate the DIGITAL AUDIO INPUT switch on the sub-control panel, and confirm that the monitor display changes to the set position.

fs ch-1, 2/ch-3,4 :

Display the fs code information of the input digital audio signal.

fs code information	display
48 kHz	48 kHz
undefind code	undefined
other than above (such as 44.1 kHz)	*1 not 48 kHz (mute)
no signal input	— — — —

Note *1 : In this mode, audio input signal is muted.

emphasis ch-1/ch-2/ch-3/ch-4 :

emphasis code information	display	circuit operation
pre-emphasis ON	on	de-emphasis on
pre-emphasis OFF	off	de-emphasis off
undefined code	undefined (off)	de-emphasis off
no signal input	— — — —	de-emphasis off

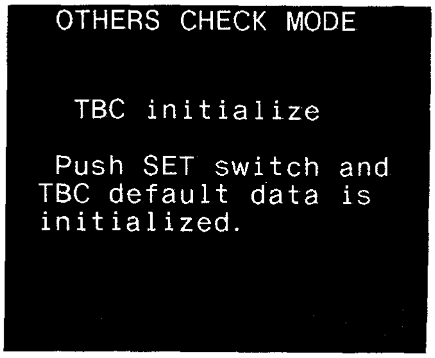
F08 : TBC initialize

Store the data into NV RAM of TBC μ-com.

IC722 (MC68HC05N-SC406682FU) on TBC-17P board for repaire part has not default data.

When replace this IC for repairing, initialization should be performed.

When the TBC board is replaced with a new one, it is not necessary to perform initialization.



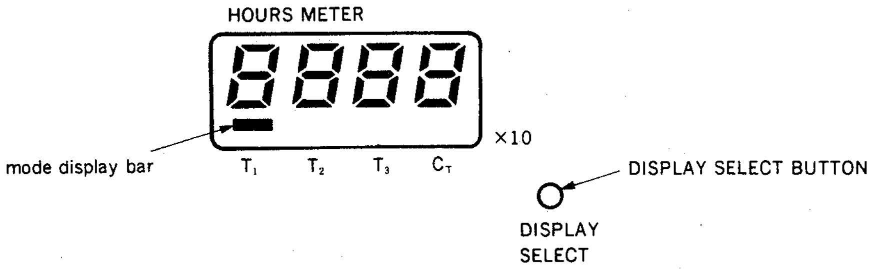
```
 OTHERS CHECK MODE


   TBC initialize

  Push SET switch and
 TBC default data is
 initialized.
```

SECTION 3
PERIODIC CHECK AND MAINTENANCE

3-1. HOURS METER

The Hours Meter is installed on the system control panel.
It is recommended to perform inspection and maintenance based on the Hours Meter.

NOTE : The Hours Meter has a built-in battery. The Hours Meter should be replaced every three years.
When replacing the Hours Meter, it is recommended to note down the total hours and times displayed for inspection and maintenance later.

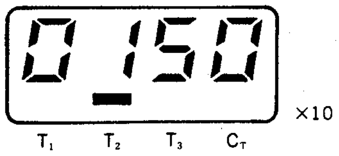


The Hours Meter has four kinds of display modes. The total operation hours or total times of operations is displayed in each mode.
To select the display mode, push the DISPLAY SELECT button at the side of the Hours Meter.

NOTE : The actual operation hours or times are equal to the displayed value multiplied by 10.

mode	contents	The unit operation status in every mode.	
		light a mode display bar	**blink a mode display bar**
T_1 : OPERATION	Displays the total hours that the power of the unit has been turned on.	POWER OFF	POWER ON
T_2 : DRUM RUNNING	Displays the total rotation hours of the drum in threading end mode.	• POWER OFF • POWER ON in mode other than threading end.	Drum is rotating in threading end mode.
T_3 : TAPE RUNNING	Displays the total running hours of the tape in fast forward, rewind, playback, search, recording, and editing modes (except for stop and standby).	• POWER OFF • POWER ON in mode other than fast forward, rewind, playback, search, recording or editing.	Tape is running in fast forward, rewind, playback, search, recording or editing mode.
C_T : THREADING	Displays the total times of threading and unthreading operations.	————	Every time if the POWER is ON or OFF.

Example : This display indicates that the total rotation hours of the drum is 1500 hours in threading end mode.



3-2. MAINTENANCE AFTER REPAIRS

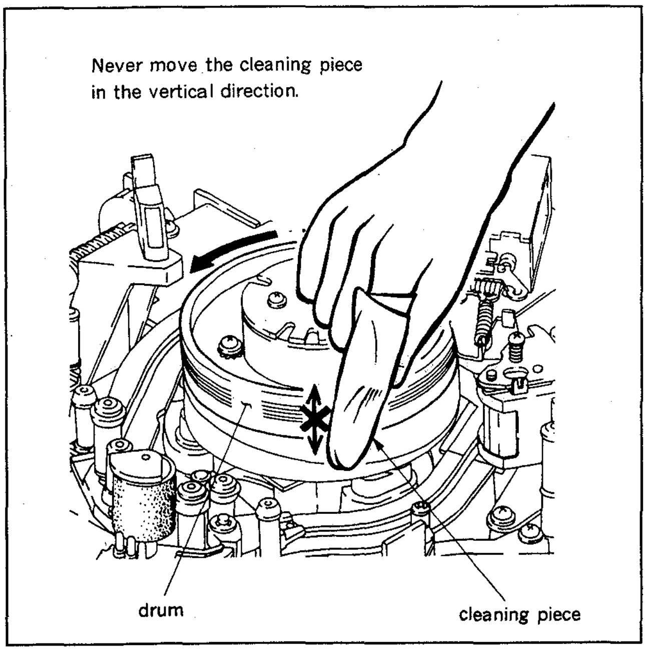
Perform the following maintenance after repairs regardless of the unit operating hours.

1. Video heads and stationary heads cleaning. (Refer to Section 3-2-1. and 3-2-2.)
2. Tape movement area cleaning. (Refer to Section 3-2-3.)

NOTE : Wait until the cleaning fluid evaporates completely before inserting a cassette tape.

3-2-1. Cleaning Procedure of Video Head

Press a cleaning piece moistened with cleaning fluid and turn a drum slowly with hand.



NOTE : • Never move the cleaning piece in the vertical direction of a head tip.
• Clean the head with the power off.

3-2-2. Cleaning Procedure of Stationary Heads

Clean with a cleaning piece moistened with cleaning fluid.

3-2-3. Cleaning Procedure of Tape Movement Areas

Wipe the tape bearing surfaces (of a tape guide, drum, capstan and pinch roller) with a cleaning piece moistened with cleaning fluid.

3-3. PERIODIC MAINTENANCE TABLE

It is recommended to perform the periodic maintenance in order to obtain correct function and higher performance, and also to extend the life of tape and unit.

Perform the periodic maintenance referring to T2 : DRUM RUNNING mode shown in hours meter.

○ mark : Execute
△ mark : Confirm. if not, replace or adjust

Item	750H	1500H	2250H	3000H	3750H	4500H	5250H	6000H	Replacement	Q'ty	Remarks
Tape running system											
Tape running surface cleaning	○	○	○	○	○	○	○	○			
Tape running confirmation/adjustment	△	△	△	△	△	△	△	△			
Cleaning roller replacement	○	○	○	○	○	○	○	○	X-3675-858-1 ROLLER SUB ASSY, C	1pc	
Upper drum assembly replacement	○	○	○	—	○	○	○	—	A-6762-466-A UPPER DRUM ASSY, DBR-29A-R	1pc	(Note 1)
Slip ring replacement	○	○	○	—	○	○	○	—	3-172-349-01 RING (10), SL1P.	1pc	
Brush replacement	○	○	○	○	○	○	○	○	—PENDING— BRUSH ASSY	1pc	
Servo automatic adjustment (B110) execute	○	○	○	○	○	○	○	○			
Servo automatic adjustment (B111) execute	○	○	○	○	○	○	○	○			
Video tracking confirmation/adjustment	△	△	△	△	△	△	△	△			
Drum assembly replacement	—	—	—	○	—	—	—	○	A-6050-852-A DRUM ASSY, DBH-29A-R	1pc	
Tape guide roller rotation confirmation/ replacement	△	△	△	△	△	△	△	△	X-3166-431-1 ROLLER (TG-6) ASSY, TAPE X-3166-037-1 ROLLER (M) ASSY, TAPE X-3166-052-1 ROLLER (S-T) ASSY, TAPE X-3166-320-1 TG-5 ASSY X-3166-386-1 TG-4 (IP) ASSY	1pc 4pcs 2pcs 1pc 1pc	
Tape guide flange wearing confirmation/ replacement	△	△	△	△	△	△	△	△	3-173-172-01 FLANGE, LOWER 3-173-176-01 NUT, ADJUSTMENT 3-174-315-01 FLANGE (UPPER) 3-174-316-01 FLANGE (LOWER)	2pcs 4pcs 5pcs 4pcs	
Bearing for cleaning roller replacement	—	○	—	○	—	○	—	○	3-669-443-01 BEARING, BALL	2pcs	
Audio/TC head replacement	—	—	—	○	—	—	—	○	8-825-776-71 HEAD, EPS244-2103F	1pc	
Confidence head replacement	—	—	—	○	—	—	—	○	8-825-771-11 HEAD, PS244-2103C	1pc	
CTL head replacement	—	—	—	○	—	—	—	○	8-825-776-41 HEAD, PS244-21C	1pc	
Full erase head replacement	—	—	—	○	—	—	—	○	8-825-770-72 HEAD, FE EF291-21	1pc	
Drive system											
Pinch roller replacement	○	○	○	○	○	○	○	○	X-3166-040-3 ARM ASSY, PINCH	1pc	
Brake shoe replacement	—	—	—	○	—	—	—	○	X-3717-205-1 LINING ASSY, C	2pcs	
Drum ground shaft replacement	—	—	—	○	—	—	—	○	X-3166-376-1 GROUND ASSY, SHAFT	1pc	
Pinch solenoid replacement	—	—	—	○	—	—	—	○	1-454-338-00 SOLENOID	1pc	
Cleaning solenoid replacement	—	—	—	○	—	—	—	○	1-454-372-11 SOLENOID	1pc	
Brake solenoid replacement	—	—	—	○	—	—	—	○	1-454-417-41 SOLENOID	2pcs	
Reel motor replacement	—	—	—	○	—	—	—	○	A-6737-207-A RM ASSY	2pcs	
Capstan motor replacement	—	—	—	○	—	—	—	○	8-835-445-01 MOTOR, DC SCV-0301A	1pc	
Threading motor replacement	—	—	—	○	—	—	—	○	8-835-179-01 MOTOR, DC MCB2B15	1pc	
Mechanical operation confirmation											
Abnormal noise	△	△	△	△	△	△	△	△			
Servo automatic adjustment (B101) execute	○	○	○	○	○	○	○	○			
Servo automatic adjustment (B109) execute	○	○	○	○	○	○	○	○			
Servo check menu execute	○	○	○	○	○	○	○	○			
FWD back tension confirmation/adjustment	△	△	△	△	△	△	△	△			
REV back tension confirmation/adjustment	△	△	△	△	△	△	△	△			
Cassette compartment operation confirmation	△	△	△	△	△	△	△	△			
Reel brake clearance confirmation	—	—	—	△	—	—	—	△			
Reel brake release amount confirmation	—	—	—	△	—	—	—	△			
Electrical confirmation											
System control operation confirmation	△	△	△	△	△	△	△	△			
DT system confirmation	△	△	△	△	△	△	△	△			
Audio specifications confirmation	△	△	△	△	△	△	△	△			
Video specifications confirmation	△	△	△	△	△	△	△	△			

Note 1 : The video head life is greatly affected by operating ambient condition and tape.

Note 2 : It is recommended to replace the fun motor on the connector panel every 10,000 hours is operation mode shown in hours meter.

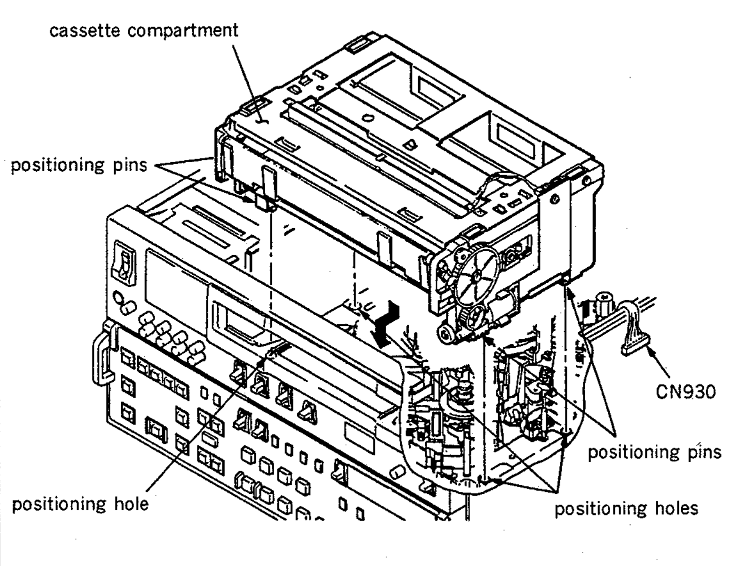
SECTION 4
REPLACEMENT OF MAJOR PARTS

4-1. GENERAL INFORMATION FOR PART REPLACEMENT AND ADJUSTMENT

1. Cassette Compartment
   When performing part replacement and mechanical adjustment, remove a cassette compartment from the unit unless otherwise specified.

Removing procedure :

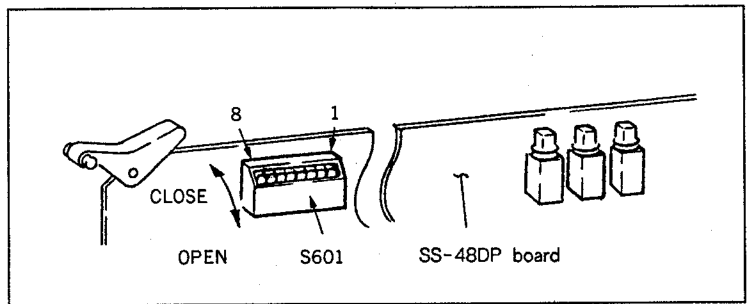
1) Remove three fixing screws of an upper panel, and remove the upper panel.
2) Disconnect a connector of a cassette compartment.
3) Loosen two fixing screws of a cassette compartment stay. These fixing screws have retainers, then they can not remove from the cassette compartment stay.
4) Remove the cassette compartment from the unit.



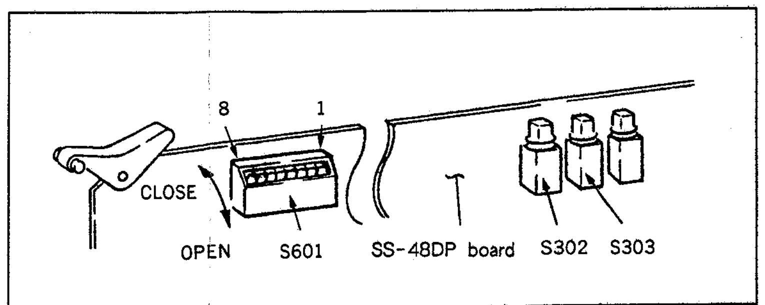
2. To Operate the Unit without Installing Cassette Compartment
   When disconnect a connector of the cassette compartment, the protection circuit operates. However the unit can operate by performing the following procedures, even if the cassette compartment is removed from the unit.

1) Turn the POWER to OFF.
2) Put Bit4 of S601 on SS-48DP board in CLOSE state.
   By this operation, the protection circuit stops its operation, and the unit can operate normaly without inserting a cassette tape or without installing the cassette comprtment.

Note : After adjustment is completed, be sure to put Bit4 of S601 on SS-48DP board in OPEN state.



3. Maintenance Menu
   This unit has a Maintenance Menu mode for video system and servo system operation check and adjustment.
   Check and adjustment procedures are described in this manual, perform according to this procedures.
   In maintenance menu mode, the following switches are mainly used.



Bit4 of S601 :
This switch is used in SERVO ADJUST mode.
Before performing the SERVO ADJUST mode, put this switch in CLOSE state.
After the SERVO ADJUST mode is completed, put it in OPEN state.
When this switch is in CLOSE state, the protection circuit stops its operation.

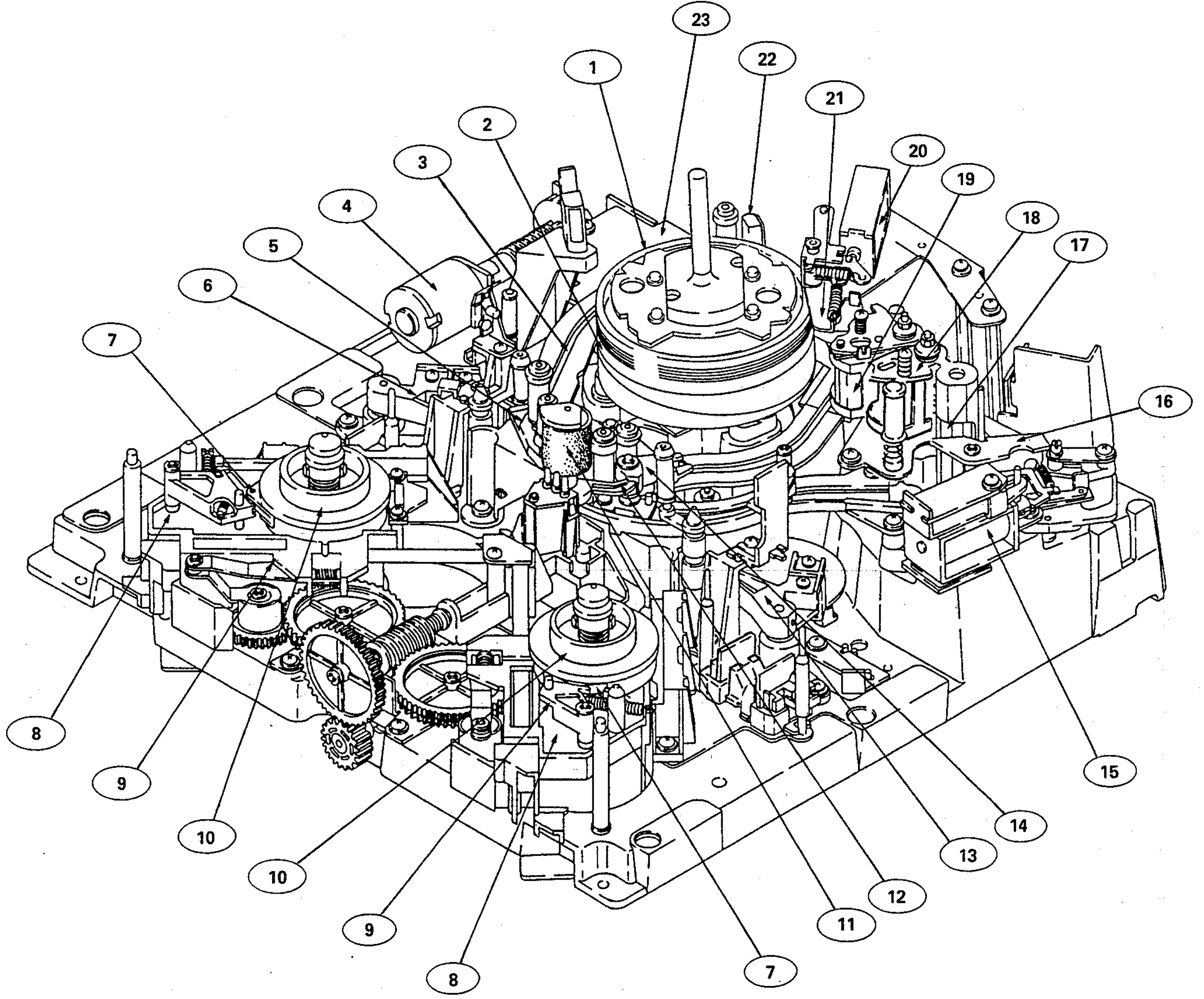
Bit7 of S601 :
This switch is used in SERVO CHECK mode.
Before performing the SERVO CHECK mode, put this switch in CLOSE state.
After the SERVO CHECK mode is completed, put it in OPEN state.

S302 :
Push this switch, then mode, menu or sub-menu of the SERVO CHECK/SERVO ADJUST is executed.

S303 :
Push this switch, then menu or sub-menu of the SERVO CHECK/SERVO ADJUST is returned to the previous state.

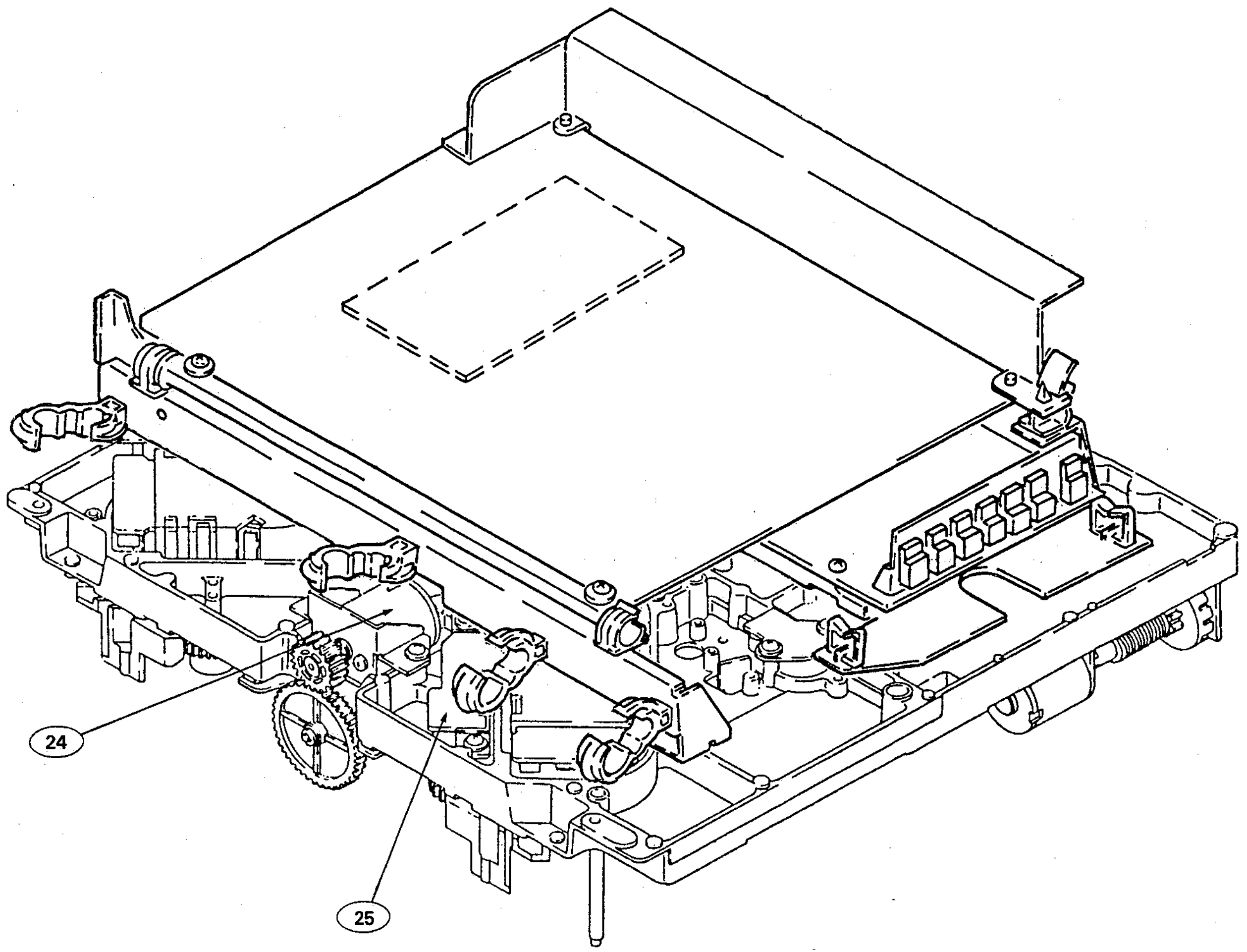
4. Index for Replacement Part
(alphabetical order)

(Top portion of the unit)



No.	Description	Section No.	Page
19	Audio/TC head	4-26	4-115
7	Brake lining assembly	4-7	4-22
17	Capstan motor	4-27	4-120
21	Cleaning roller assembly	4-6	4-20
20	Cleaning solenoid	4-9	4-31
18	Confidence head	4-28	4-127
22	CTL head	4-25	4-113
2	Drum assembly	4-3	4-12
16	Pinch press block	4-21	4-97
11	Pinch roller assembly	4-5	4-19
15	Pinch solenoid	4-22	4-98
12	P slider assembly	4-18	4-65
9	Reel motor	4-12	4-38
8	Reel motor plate	4-11	4-36
10	Reel table	4-10	4-32
5	S slider assembly	4-16	4-58
6	S tension regulator arm assembly	4-19	4-68
–	Tape guide	4-8	4-26
23	Threading gear	4-24	4-108
4	Threading motor	4-15	4-55
3	Threading ring	4-23	4-103
14	T slider assembly	4-17	4-61
13	T tension regulator arm assembly	4-20	4-88
1	Upper drum assembly	4-2	4-6

(Bottom portion of the unit)



No.	Description	Section No.	Page
24	Reel position motor	4-13	4-52
25	Reel position sensor	4-14	4-54

4-1-1. Index for Adjustment Item

(alphabetical order)
(except tape path system alignment)

Adjustment Item	Section No.	Page
Audio/TC head zenith adjustment	5-3	5-8
Brush position adjustment	4-4-1	4-18
Capstan FG duty adjustment	4-27-2	4-123
Capstan speed adjustment	4-27-3	4-125
Capstan motor operation check	4-27-1	4-122
Cassette pillar (S) height adjustment	4-10-1	4-33
Cleaning roller block position adjustment	4-6-1	4-21
Confidence head zenith adjustment	5-2	5-6
Drum motor operation check	4-3-1	4-16
FWD back tension adjustment	4-19-3	4-80
Pinch solenoid position adjustment	4-22-1	4-101
Reel brake clearance check	4-7-1	4-24
Reel brake release amount adjustment	4-7-2	4-25
Reel FG duty adjustment	4-12-3	4-42
Reel motor operation check	4-12-2	4-42
Reel motor shaft slantness adjustment	4-12-1	4-41
Reel position motor operation check	4-13-1	4-53
Reel rotation detector position adjustment	4-10-3	4-35
Reel table height adjustment	4-10-2	4-34
REV back tension adjustment	4-19-4	4-84
S reel offset/friction adjustment	4-12-4	4-44
S reel torque adjustment	4-12-5	4-46
S tension regulator arm operating position adjustment	4-19-1	4-70
S tension sensor sensitivity adjustment	4-19-2	4-74
Threading motor operation check	4-15-1	4-56
T reel offset/friction adjustment	4-12-6	4-48
T reel torque adjustment	4-12-7	4-50
T tension sensor sensitivity adjustment	4-20-2	4-94
T tension regulator arm operating position adjustment	4-20-1	4-90
Upper drum eccentricity adjustment	4-2-1	4-10

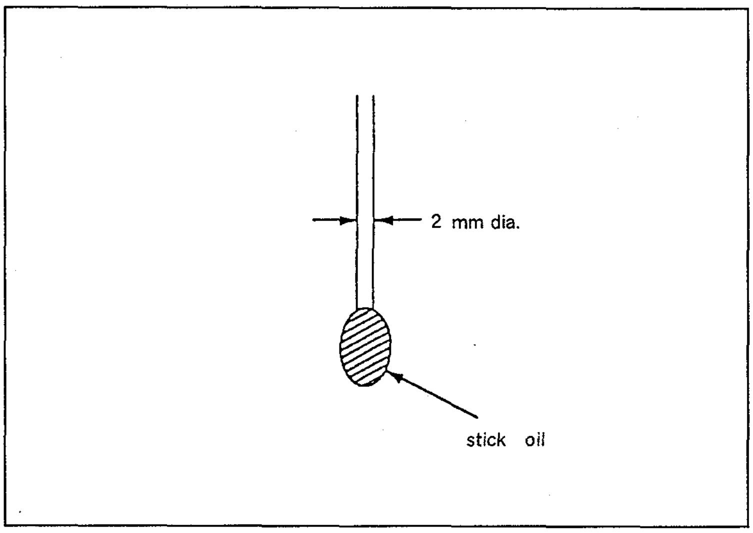
5. Oil

Apply only the specified oil when oiling is required for replacing parts and/or adjustment. If a different oil is used, major malfunctions may be caused due to differences in oil viscosity and ingredients.

SONY part number : 7-661-018-18

If oil is used that has been mixed with dust, shafts and bearings may be damaged, causing major malfunctions.

One drop of oil is defined as follows :
About the amount that will adhere to the end of a stick 2 mm in diameter, as shown in the figure.



6. Grease

SONY part number : 7-662-001-41
(Molyton grease, No.320)
SONY part number : 7-662-010-04
(Grease, SGL-505)

Smear only the specified grease product to sliding part. If a different grease is used, major malfunctions may be caused due to differences in viscosity and ingredients.
Major malfunctions may also be caused by using grease that has been mixed with dust.

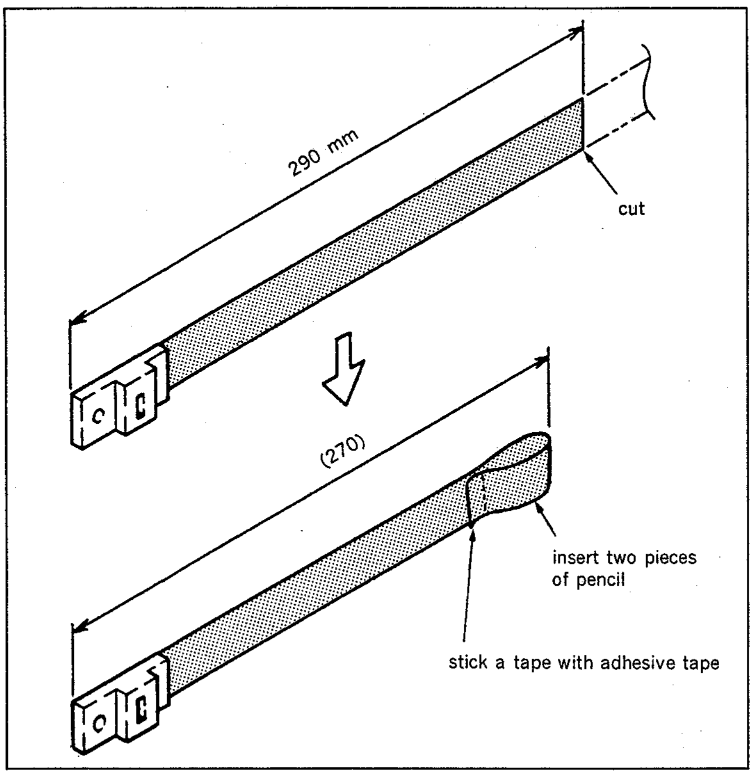
Amounts of grease to smear
Smear just enough grease to create a thin film on the surface of the part. Any grease that adheres to other surrounding parts must be removed with gauze or soft cloth.

7. Tension measurement tape
Prepare the following tool :

J-6327-930-A

This tension measurement tape uses a S tension regulator arm operating position adjustment, T tension regulator arm operating position adjustment and S tension sensor sensitivity adjustment.
How to create the tension measurement tape.

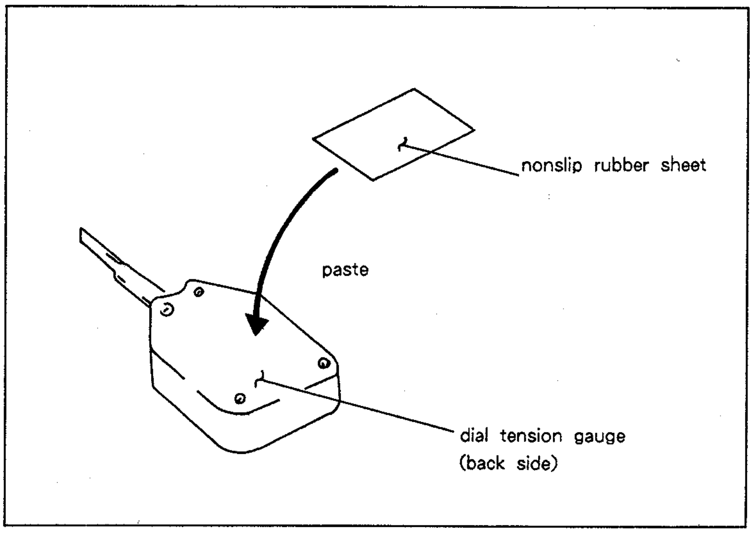
1) Cut a video tape as shown in the figure.
2) Make a loop while inserting two pieces of pencil as shown in the figure, and stick a video tape.


290 mm
cut
(270)
insert two pieces of pencil
stick a tape with adhesive tape

8. Nonslip rubber sheet

SONY part number : J-6327-980-A

This rubber sheet prevents to dial tension gauge from slipping on a reference plate. It is recommended to use this rubber sheet when S and T tension regulator arm operating position adjustments, and S and T tension sensor sensitivity adjustments are performed.


nonslip rubber sheet
paste
dial tension gauge
(back side)

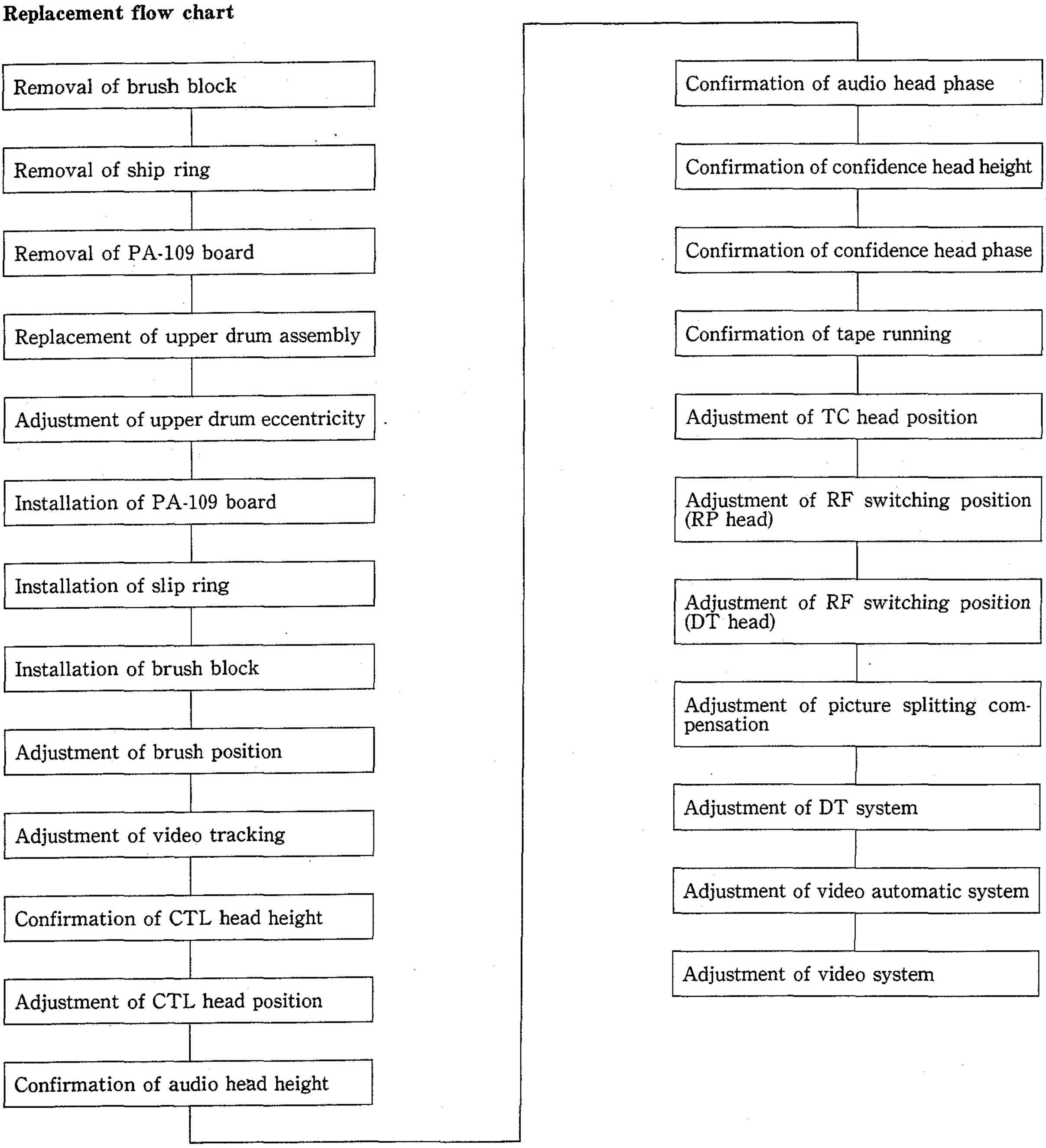
4-2. UPPER DRUM ASSEMBLY REPLACEMENT

- The upper drum assembly is a periodic replacement part. It is recommended to replaced periodically based on the periodic maintenance table.
- When the video heads are worn or damaged, replace an upper drum assembly.
- When the upper drum assembly is removed, if a spacer is placed on the flange, be sure to leave it in place on the flange. If the spacer is lost or replaced with one of a difference thickness, the height of the video head from its reference surface will be changed, making it impossible to get interchangiability.

Tools

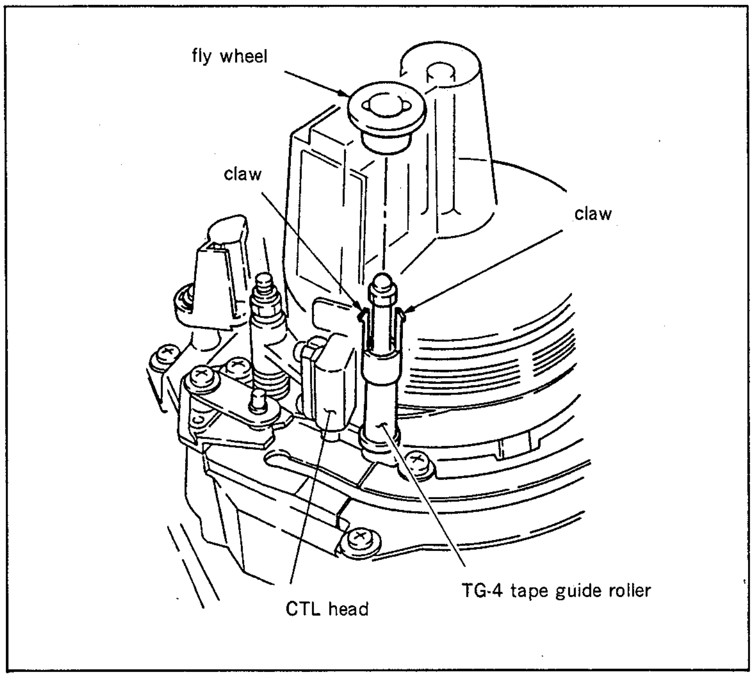
Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01

Replacement flow chart

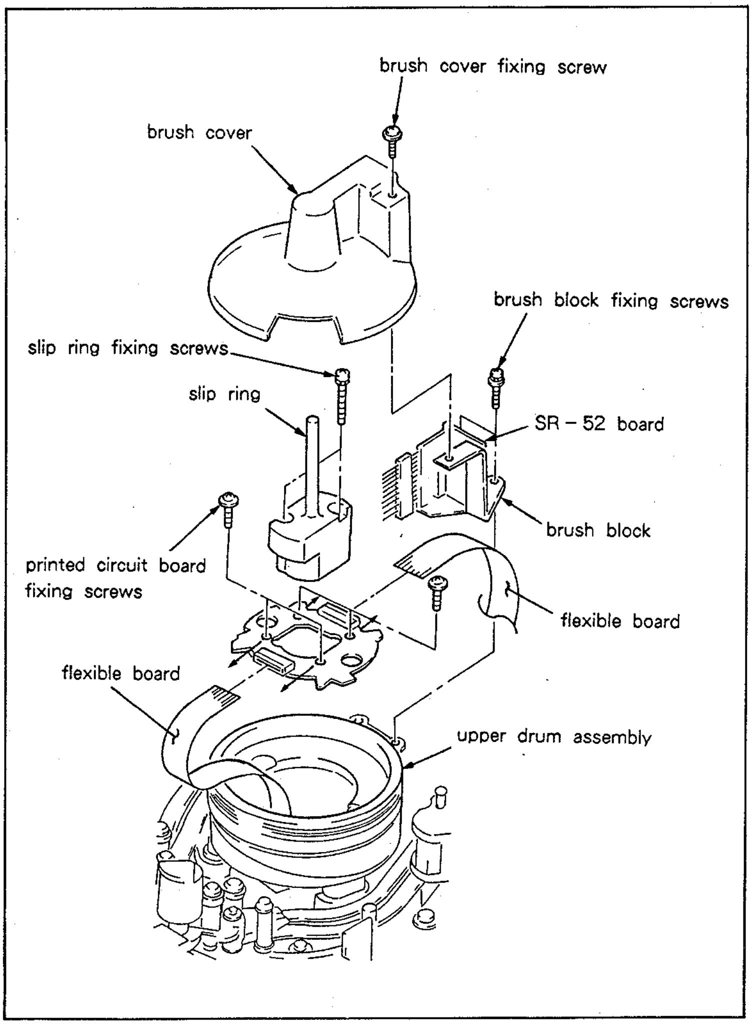

Removal of brush block
Removal of ship ring
Removal of PA-109 board
Replacement of upper drum assembly
Adjustment of upper drum eccentricity
Installation of PA-109 board
Installation of slip ring
Installation of brush block
Adjustment of brush position
Adjustment of video tracking
Confirmation of CTL head height
Adjustment of CTL head position
Confirmation of audio head height
Confirmation of audio head phase
Confirmation of confidence head height
Confirmation of confidence head phase
Confirmation of tape running
Adjustment of TC head position
Adjustment of RF switching position (RP head)
Adjustment of RF switching position (DT head)
Adjustment of picture splitting compensation
Adjustment of DT system
Adjustment of video automatic system
Adjustment of video system

Removal

1. Hold claws of the upper part of a TG-4 tape guide roller using tweezers, and remove a fly wheel.

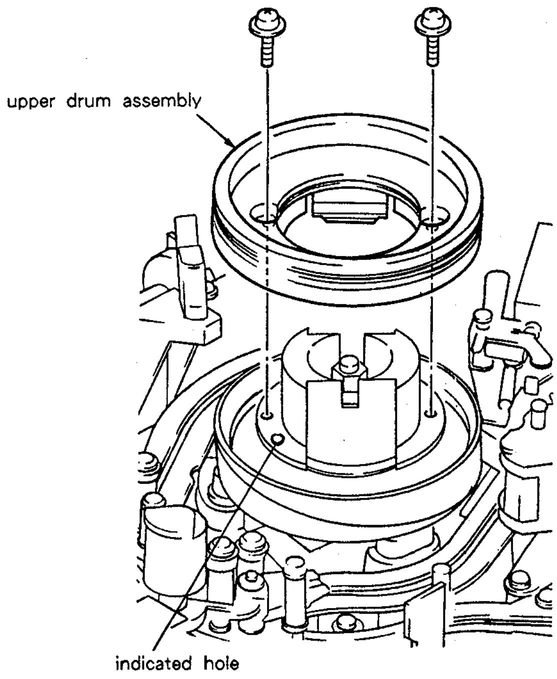

fly wheel
claw
claw
CTL head
TG-4 tape guide roller

2. Disconnect two connectors CN961 and CN962 on SR-52 board of a brush block.
3. Remove a fixing screw as shown in the figure, and remove a brush cover.
4. Remove two screws holding the brush block to the poles, and remove the brush block.
5. Remove two screws as shown in the figure, and remove a slip ring.
6. Push two connector housings on the printed circuit board in an upper drum assembly in the direction shown in the figure respectively, and remove two flexible boards.
7. Remove four screws holding the printed circuit board in the upper drum assembly, and lift the printed circuit board straight up to remove.


brush cover fixing screw
brush cover
brush block fixing screws
slip ring fixing screws
slip ring
SR – 52 board
brush block
printed circuit board fixing screws
flexible board
flexible board
upper drum assembly

8. Remove two screws holding the upper drum assembly, and lift the upper drum assembly straight up to remove.

Note : Never contact the upper drum assembly to the TG-4, CTL head, stationary guide and cleaning roller when removing the upper drum assembly.



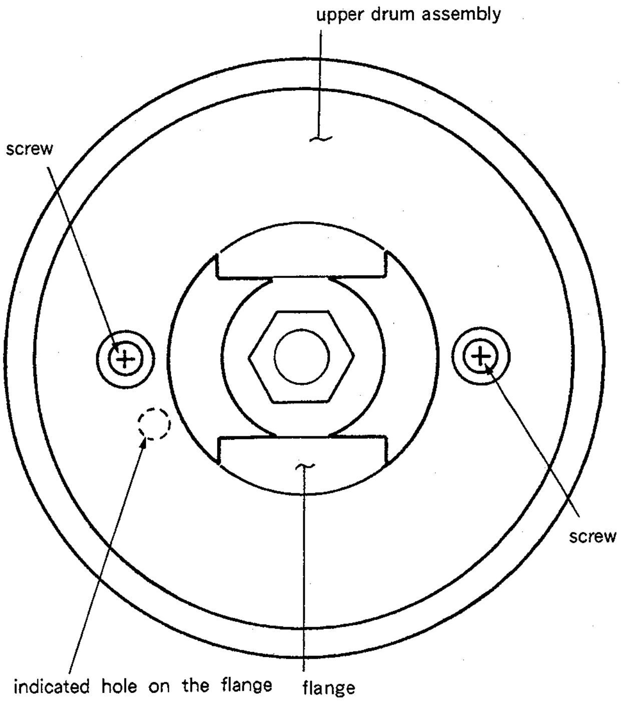
Installation

9. Clean the flange surface of a lower drum and the installation surface of a new upper drum assembly with a cleaning piece moistened with cleaning fluid.
10. As shown in the figure, place A-mark of the upper drum assembly as indicated hole on the flange and put it on the flange, then secure it with two screws and washers snugly, but do not tighten.

Note 1 : When placing the upper drum assembly on the lower drum, never make a scratch or otherwise damage on the tape running surface and video heads of the upper drum assembly.

Note 2 : Never contact the upper drum assembly to the TG-4, CTL head, stationary guide and cleaning roller when installing the upper drum assembly on the flange.

Note 3 : When placing the upper drum assembly on the flange, pay particular attention to install in correct position.



Adjustment after replacement

11. Perform upper drum eccentricity adjustment. (Refer to Section 4-2-1.)
12. Place ACH-mark of the printed circuit board as A-mark indicated on the upper drum assembly and put it on the upper drum assembly.

Note : When placing the printed circuit board on the upper drum assembly, pay particular attention to install in correct position.

13. Secure the printed circuit board with four screws (P2×8) and washers to the upper drum assembly.
14. Insert the flexible printed circuit boards into the connector housings respectively, and push the housings to the opposite direction of the arrow to lock them.
15. Install the slip ring with two screws (PS2×12).
16. Install the brush block with two screws (PS2.6×5) to the poles snugly, but do not tighten.
17. Perform brush position adjustment. (Refer to Section 4-4-1.)
18. Install the brush cover.
19. Connect connectors CN961 and CN962 to SR-52 board of brush block.
20. Perform video tracking adjustment. (Refer to Section 5-5.)
21. Perform CTL head height adjustment. (Refer to Section 5-6.)
22. Perform CTL head position adjustment. (Refer to Section 5-7.)
23. Perform confirmation of audio head height. (Refer to Section 5-8.)
24. Perform confirmation of audio head phase. (Refer to Section 5-9.)
25. Perform confirmation of confidence head height. (Refer to Section 5-11.)
26. Perform confirmation of confidence head phase. (Refer to Section 5-12.)
27. Perform confirmation of tape running. (Refer to Section 5-4.)
28. Perform TC head position adjustment. (Refer to Section 5-14.)
29. Align two claws of the upper part of the TG-4 tape guide roller and two grooves of the fly wheel, then install the fly wheel to the TG-4 tape guide roller.
30. Perform RF switching position (RP head) adjustment. (Refer to Section 5-16.)
31. Perform RF switching position (DT head) adjustment. (Refer to Section 5-17.)
32. Perform picture splitting compensation adjustment. (Refer to Section 5-19.)
33. Perform DT system adjustment.
34. Perform video automatic adjustment.
35. Perform video system adjustment.

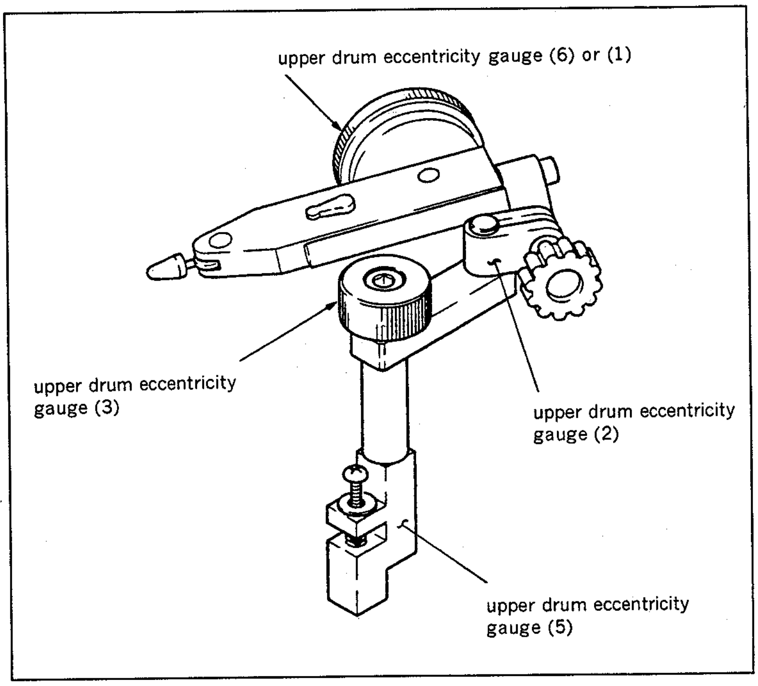
4-2-1. Upper Drum Eccentricity Adjustment

- Be sure to perform an upper drum eccentricity adjustment, when the upper drum is replaced.

Tools

Upper drum eccentricity gauge(2)	J-6001-830-A
Upper drum eccentricity gauge(3)	J-6001-820-A
Upper drum eccentricity gauge(5)	J-6087-000-A
Upper drum eccentricity gauge(6)	J-6325-530-A or(1): J-6001-840-A
Cleaning piece	2-034-697-00
Cleaning fluid	9-919-573-01

Assemble the upper drum eccentricity gauges as shown in the figure.


upper drum eccentricity gauge (6) or (1)
upper drum eccentricity gauge (3)
upper drum eccentricity gauge (2)
upper drum eccentricity gauge (5)

For reference :

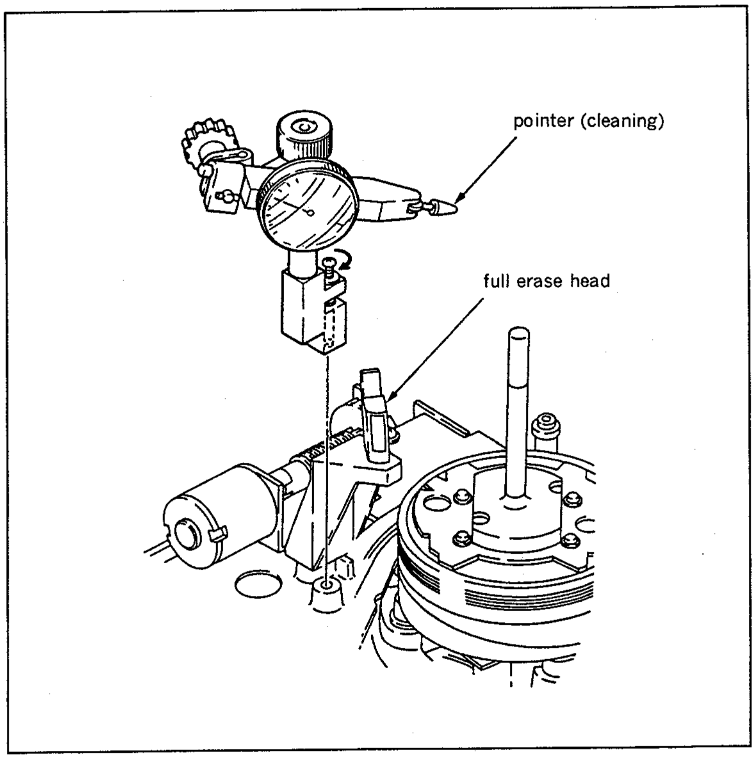
Drum eccentricity adjustment gauge (J-6080-038-A) and dial gauge holder (J-6080-039-A) are able to use for the upper drum eccentricity adjustment instead of to use drum eccentricity gauges (2), (3) and (5).

Adjustment

1. Clean the pointer of the assembled upper drum eccentricity gauges with a cleaning piece moistened with cleaning fluid.

Note : The tape running surface of the upper drum may be damaged if the gauge is used with dirt or dust adhering to the pointer.

2. Install the assembled upper drum eccentricity gauges to the installing screw hole shown in the figure, which is on the cassette side of full erase head base.


pointer (cleaning)
full erase head

3. Adjust the position of the gauge so that the pointer is positioned about 5 mm away from the upper edge of the upper drum assembly.

Note : Pay particular attention not to touch the pointer to the video heads.

4. Turn the upper drum slowly in the clockwise direction. Make sure that the pointer deviation indicated in one full turn of the upper drum satisfies the specification.

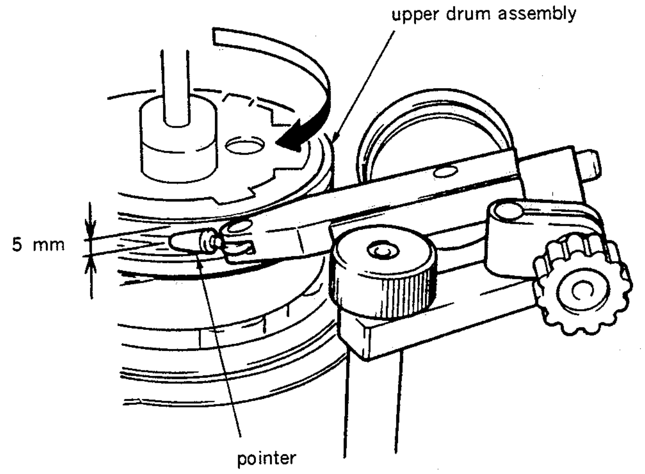
Specification : 3 μm or less.

If the specification is satisfied, perform step (6) and later.
If the specification is not satisfied, perform step (5) and later.

5. Perform if the specification is not satisfied :
   (1) Turn the upper drum slowly in the clockwise direction, and make sure that the amount of the pointer deviation.
   (2) Turn the upper drum slowly in the clockwise direction, and stop the turning at the place where the least pointer deviation is indicated.
   (3) Adjust the position of the upper drum to about one-half the amount of the pointer deviation by pressing with finger against the upper edge of the upper drum assembly at a point 180 degrees opposed to the contact point of pointer. If no movement is produced by this adjustment, slightly loosen two screws of the upper drum assembly. If the movement occurs too readily, tighten two screws slightly.
   (4) Make sure that the deviation of the eccentricity again to satisfies the specification.
6. Tighten two screws alternately and gradually (tightening torque : 0.8 N•m {8 kgf•cm}).
7. Make sure that the eccentricity of the upper drum to satisfiy the specification.
8. Remove the upper drum eccentricity gauges.

Note : Take care not to contact the pointer with the video heads.

9. Clean the video heads and tape running surface of the upper drum assembly with a cleaning piece moistened with cleaning fluld.
After cleaning, be sure to wipe the cleaned surface two to three times with a dry cloth.



Spec. : The pointer deviation is within 3 μ m.

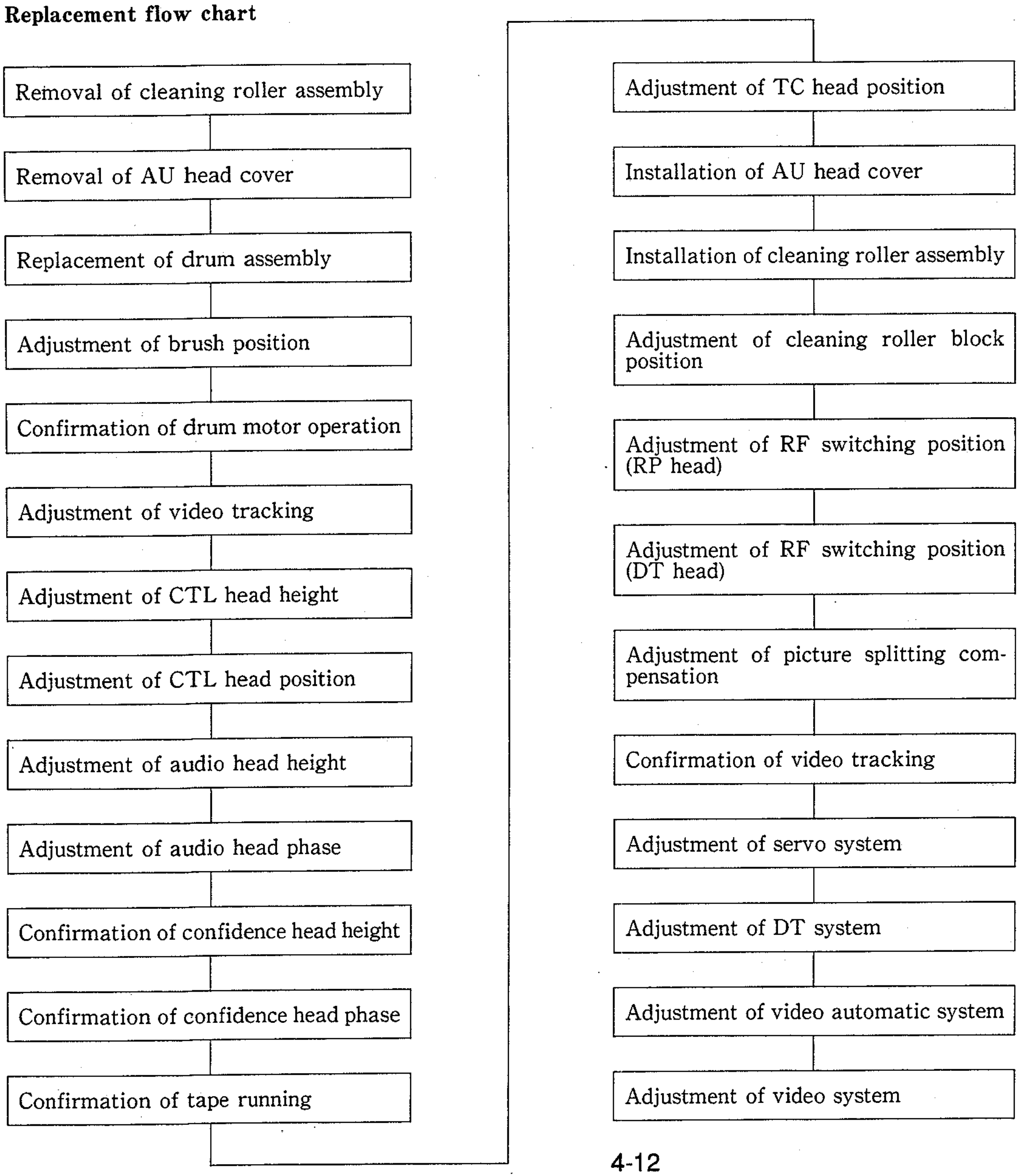
4-3. DRUM ASSEMBLY REPLACEMENT

- A drum assembly is a periodic replacement part. It is recommended to replace periodically based on the periodic maintenance table.
- It is necessary to replace the drum assembly in the following cases :
  (1) The lead surface of a lower drum is worn, and a correct RF waveform cannot be obtained even when tracking adjustment is performed.
  (2) The lower drum's lead surface and tape running surface of the lower drum are scratched and cannot be repaired.
  (3) The drum shaft bearings are out of life, resulting in noise or jitter that makes it impossible to maintain the performance of the unit.
- When replacing the drum assembly, replace an upper drum assembly at the same time.

Tools

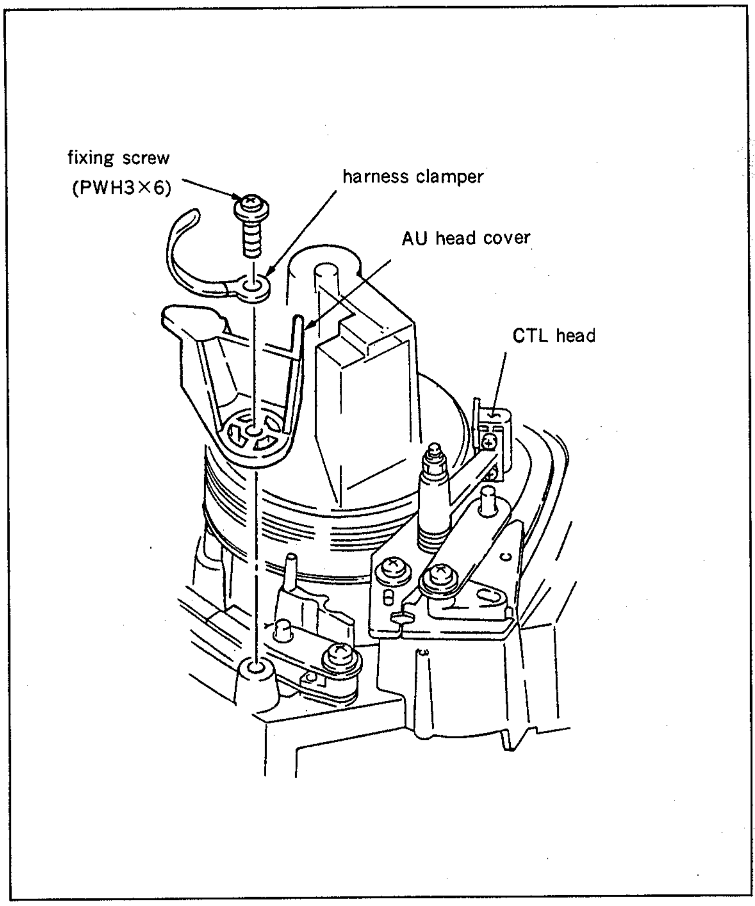
Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01

Replacement flow chart


Removal of cleaning roller assembly
Removal of AU head cover
Replacement of drum assembly
Adjustment of brush position
Confirmation of drum motor operation
Adjustment of video tracking
Adjustment of CTL head height
Adjustment of CTL head position
Adjustment of audio head height
Adjustment of audio head phase
Confirmation of confidence head height
Confirmation of confidence head phase
Confirmation of tape running
Adjustment of TC head position
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position
Adjustment of RF switching position (RP head)
Adjustment of RF switching position (DT head)
Adjustment of picture splitting compensation
Confirmation of video tracking
Adjustment of servo system
Adjustment of DT system
Adjustment of video automatic system
Adjustment of video system

Removal

1. Remove a cleaning roller assembly. (Refer to steps (1) and (2) in Section 4-6.)
2. Remove a fly wheel of the upper part of a TG-4 tape guide roller. (Refer to step (1) in Section 4-2.)
3. Remove a fixing screw (PWH3×6), and remove an AU head cover. At this time, the harness clamper of the drum comes off together.
4. Remove a brush block. (Refer to steps from (2) to (4) in Section 4-2.)

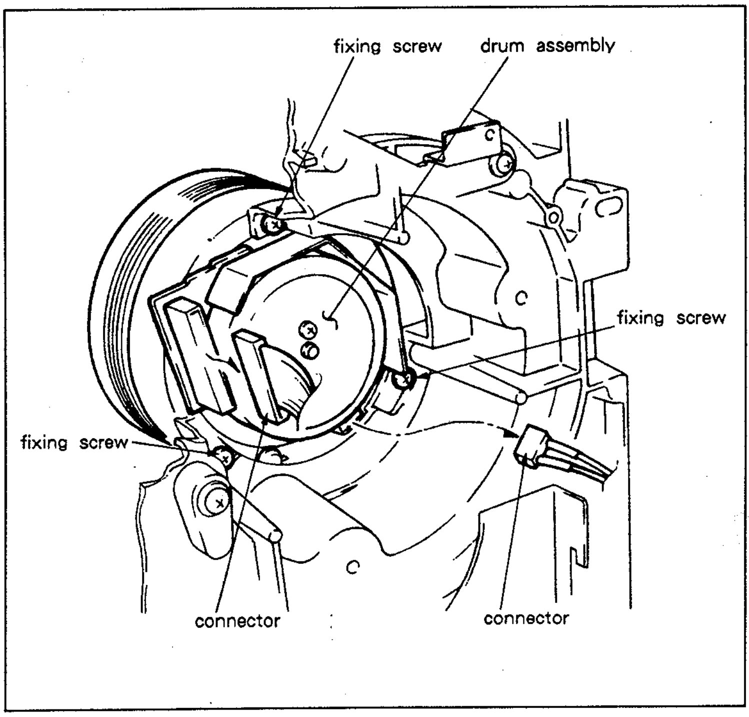

fixing screw
(PWH3×6)
harness clamper
AU head cover
CTL head

5. Open DR-118B board.
6. Disconnect connectors CN965, CN966 and CN967 connected to a drum assembly.
7. Hold the drum assembly from the unit surface by hand, and remove three screws from back side of the unit which are installing the drum assembly.

Note 1 : Hold the drum assembly with hands to prevent it from dropping.

Note 2 : Be careful not to damage the guides and other parts surrounding the drum assembly.

8. Slightly raise up the drum assembly, and disconnect two connectors CN963 and CN964 connected to the drum assembly.
9. Remove the drum assembly from the unit.


fixing screw
drum assembly
fixing screw
fixing screw
connector
connector

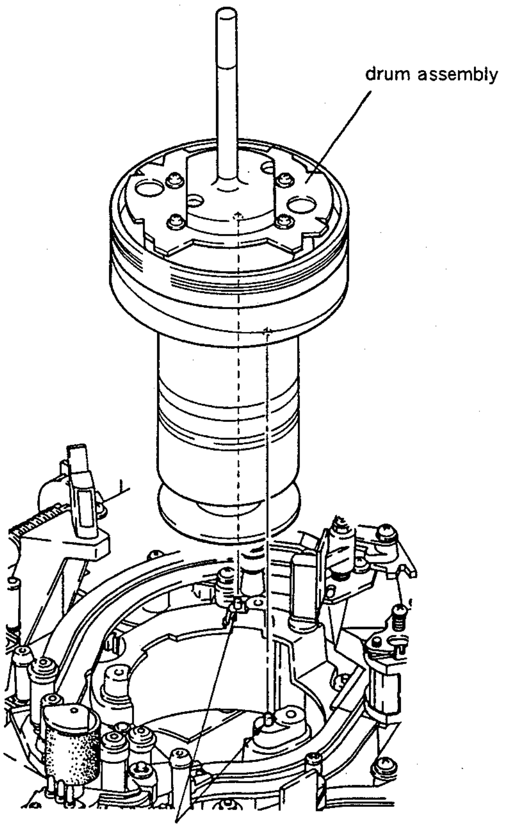
Installation

10. Clean the new drum assembly mounting surface and the chassis with cleaning piece moistened with cleaning fluid.
11. Connect the connectors CN963 and CN964 to a new drum assembly.
12. Install the drum assembly to the chassis while putting two guide pins of the chassis into the guide holes which are on the lower side of the new drum assembly.

Note 1: Pay particular attention not to cause damages to the tape running surface of the upper drum, video heads, lower drum's tape running surface and lead of the lower drum.

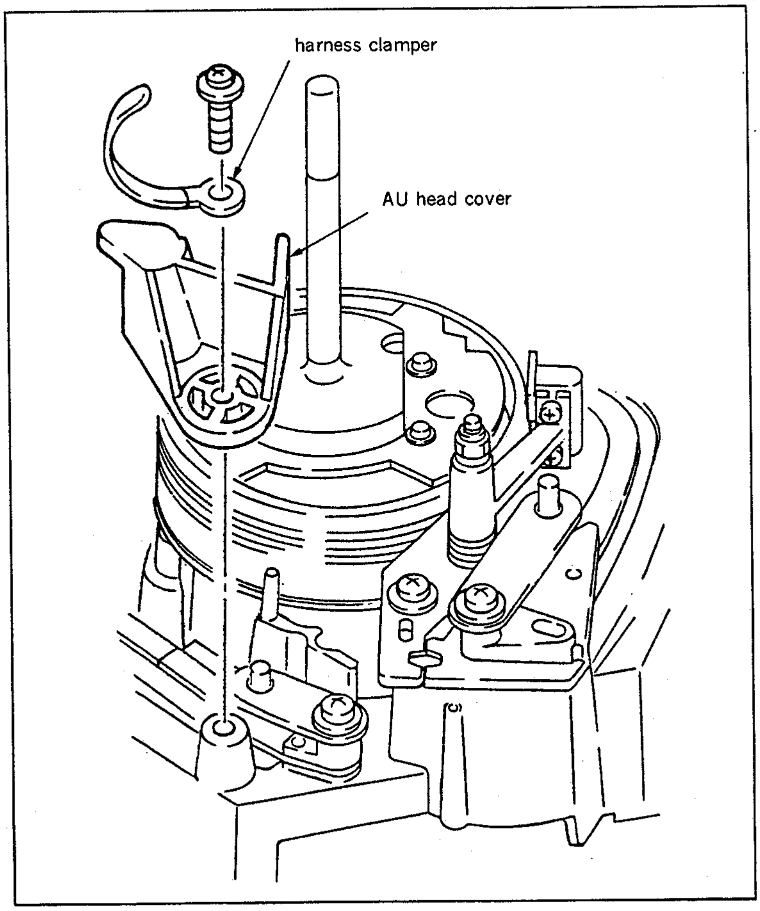
Note 2: Pay particular attention not to cause damages by contacting the guides and other parts surrounding the drum assembly.

13. Tighten the drum assembly with three screws.
14. Connect two connectors CN965, CN966 and CN967 to drum assembly.
15. Clean the tape running surface of the drum assembly with a cleaning piece moistened with cleaning fluid. After cleaning, be sure to clean the cleaned surface two or three times with a soft dry cleaning piece.
16. Install the brush block to the studs with two screws snugly, but do not tighten.
17. Perform brush position adjustment. (Refer to Section 4-4-1.)
18. Install the brush cover.
19. Connect two connectors CN961 and CN962 to SR-52 board of the brush block.



Adjustments after replacement

20. Perform confirmation of drum motor operation. (Refer to Section 4-3-1.)
21. Perform video tracking adjustment. (Refer to Section 5-5.)
22. Perform CTL head height adjustment. (Refer to Section 5-6.)
23. Perform CTL head position adjustment. (Refer to Section 5-7.)
24. Perform audio head height adjustment. (Refer to Section 5-8.)
25. Perform audio head phase adjustment. (Refer to Section 5-9.)
26. Perform confirmation of confidence head height. (Refer to Scetion 5-11.)
27. Perform confirmation of confidence head phase. (Refer to Scetion 5-12.)
28. Perform confirmation of tape running. (Refer to Section 5-4.)
29. Perform TC head position adjustment. (Refer to Section 5-14.)
30. Install the AU head cover together with the drum harness clamper.
31. Install the fly wheel to the upper part of the TG-4 tape guide roller. (Refer to step (29) in Section 4-2.)
32. Install the cleaning roller assembly. (Refer to steps (7) and (8) in Section 4-6.)
33. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)
34. Perform RF switching position (RP head) adjustment. (Refer to Section 5-16.)
35. Perform RF switching position (DT head) adjustment. (Refer to Section 5-17.)
36. Perform picture splitting compensation adjustment. (Refer to Section 5-19.)
37. Perform confirmation of video tracking. (Refer to Section 5-5.)
38. Perform DT system adjustment.
39. Perform video automatic adjustment.
40. Perform video system adjustment.



4-3-1. Drum Motor Operation Check

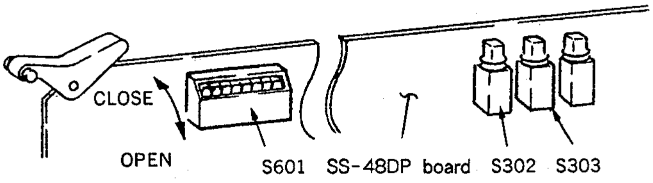
- Be sure to perform the drum motor operation check when a drum assembly is replaced.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

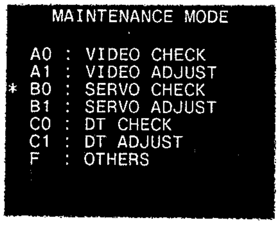
Check

1. Put Bit7 of S601 on SS-48DP board in CLOSE state, and turn the POWER to ON.
2. Press S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move ∗ mark to "BO: SERVO CHECK" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVO CHECK" mode.
5. Move ∗ mark to "BO2: MOTOR CHECK" which is displaying on the monitor screen with the search dial.
6. Press S302 on SS-48DP board to select "MOTOR CHECK" menu.
7. Move ∗ mark to "BO26: DRUM MOTOR" which is displaying on the monitor screen with the search dial.
8. Press S302 on SS-48DP board and to execute "DRUM MOTOR" sub-menu.
9. Check the followings appears on the monitor screen :
   "SPEED : OK"
   "PHASE : LOCK"
   "PG : EXIST"
   If above messages are not displayed, check that five connectors connected with the drum assembly are inserted surely.
   If above messages are still not displayed, check the drum driver circuit, drum FG amplifier circuit and drum PG amplifier circuit (on DR-118B board).
10. Press S303 on SS-48DP board, and check that the drum rotation stops.
11. Press S303 twice on SS-48DP board to return to the mode screen.
12. Turn the POWER to OFF, and put Bit7 of S601 on SS-48DP board in OPEN state.



S601-7/SS-48DP : CLOSE

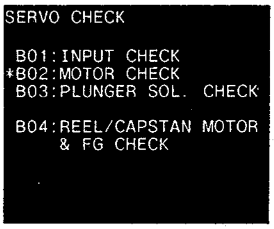
↓ press S302



```
        MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
* B0 : SERVO CHECK
  B1 : SERVO ADJUST
  C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

select with search dial

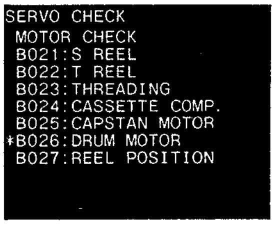
↓ press S302



```
SERVO CHECK

 B01:INPUT CHECK
*B02:MOTOR CHECK
 B03:PLUNGER SOL. CHECK

 B04:REEL/CAPSTAN MOTOR
     & FG CHECK
```

select with search dial

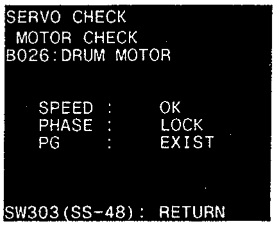
↓ press S302



```
SERVO CHECK
 MOTOR CHECK
 B021:S REEL
 B022:T REEL
 B023:THREADING
 B024:CASSETTE COMP.
 B025:CAPSTAN MOTOR
*B026:DRUM MOTOR
 B027:REEL POSITION
```

select with search dial

↓ press S302



```
SERVO CHECK
 MOTOR CHECK
B026:DRUM MOTOR


   SPEED :    OK
   PHASE :    LOCK
   PG    :    EXIST


SW303(SS-48): RETURN
```

↓ press S303

drum motor stops its rotation

↓ press S303 twice

S601-7/SS-48DP : OPEN

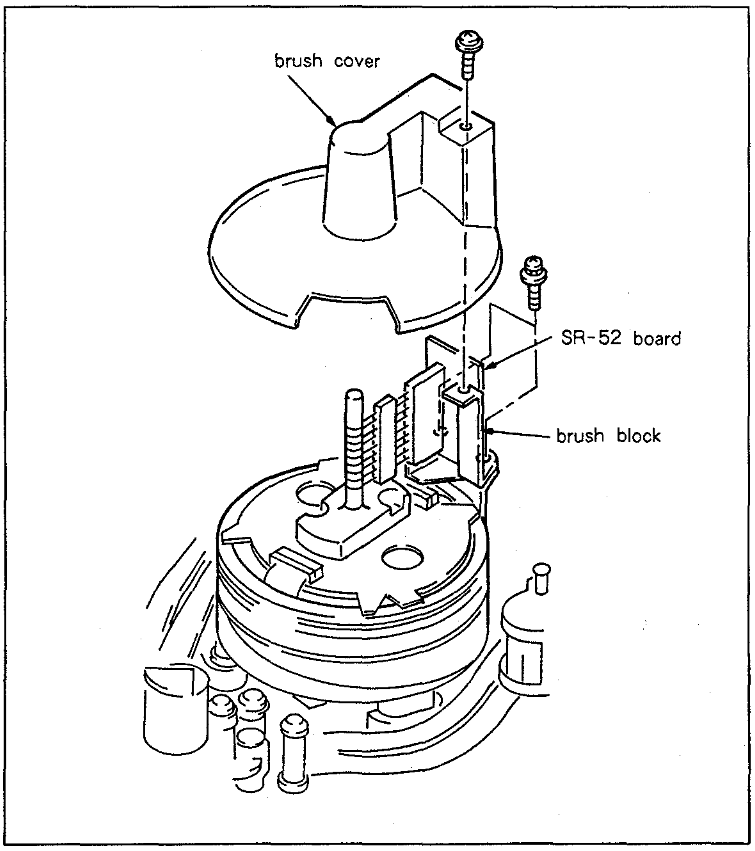
4-4. BRUSH BLOCK REPLACEMENT

Removal

1. Disconnect two connectors CN961 and CN962 on SR-52 board of a brush block.
2. Remove a fixing screw as shown in the figure, and remove a brush cover.
3. Remove two screws holding the brush block to the poles, and remove the brush block.

Installation

4. Install a new brush block with two screws (PS2.6×5) to the poles snugly, but do not tighten.
5. Perform brush position adjustment.
   (Refer to Section 4-4-1.)
6. Install the brush cover.
7. Connect connectors CN961 and CN962 to SR-52 board of brush block.



4-4-1. Brush Position Adjustment

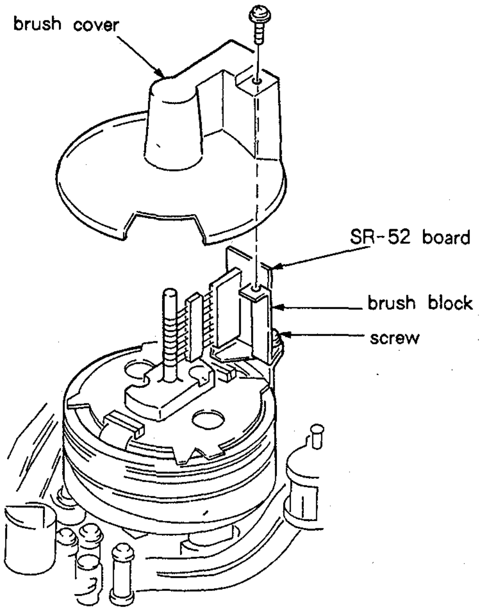
Adjustment

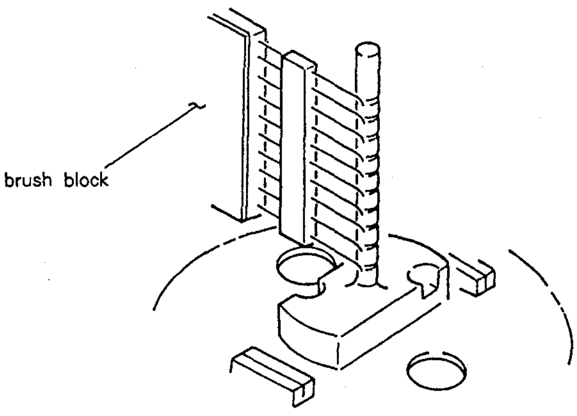
1. Remove a brush cover from the unit. (Refer to step (2) in Section 4-4.)
2. Loosen two screws holding a brush block 1/2 to 1 turn.
3. Move the brush block in the direction in the arrow to meet both specifications, and tighten two screws.

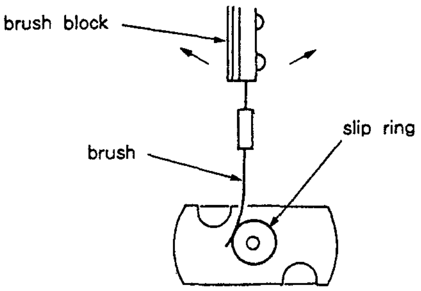
Spec. 1 : The brushes are positioned in the grooves of the slip ring.

Spec. 2 : The bend of the brush meets the required specification (shown in the figure).

4. Install the brush cover.


brush cover
SR-52 board
brush block
screw


brush block


brush block
slip ring
brush

Spec. : When looking down, the root of the brush and the center of the slip ring are on a same line.

4-5. PINCH ROLLER ASSEMBLY REPLACEMENT

- The pinch roller assembly is a periodic replacement part. It is recommended to replaced periodically based on the periodic maintenance table.
- When a pinch roller assembly is worn or damaged, replace the pinch arm assembly.

Replacement flow chart

Replacement of pinch arm assembly

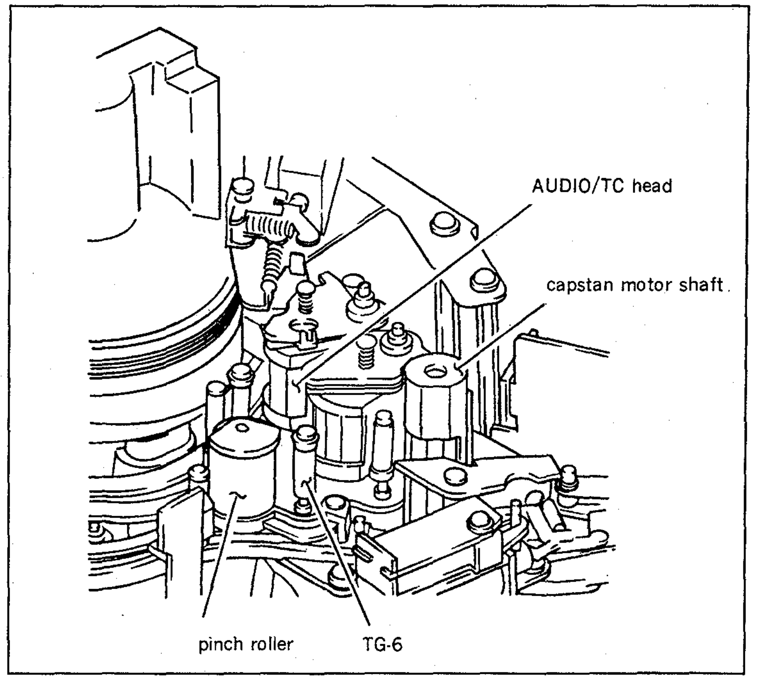
Confirmation of tape running

Confirmation of audio head height

Confirmation of audio head phase

Confirmation of confidence head height

Confirmation of confidence head phase



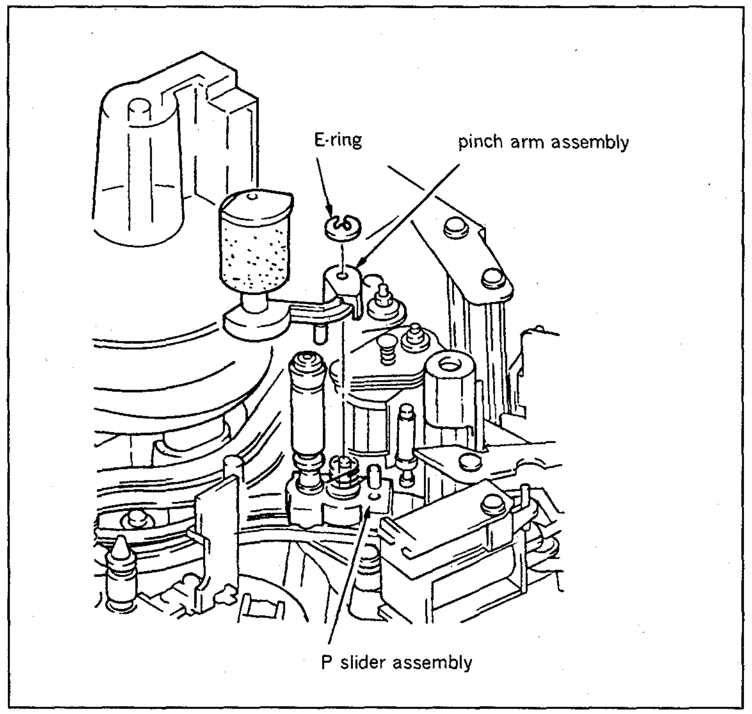
Tool

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01

Removal

1. Remove a cassette compartment.
2. Turn the POWER to ON.
3. Turn the POWER to OFF when a pinch roller comes to a position in front of a TG-6 tape guide.
4. Remove an E-ring on the upper part of a pinch arm assembly, and remove the pinch arm assembly from a P slider assembly.

Note : Do not remove a polyslider washer and spring at the bottom of the pinch arm assembly.



Installation

5. Rub surface of the installing shaft of the pinch arm assembly with cotton swab moistened with oil, in other words, apply about a half of drop oil to the shaft.
6. Set a spring as shown in the figure, and install a new pinch arm assembly and fasten it to the P slider assembly with E-ring.

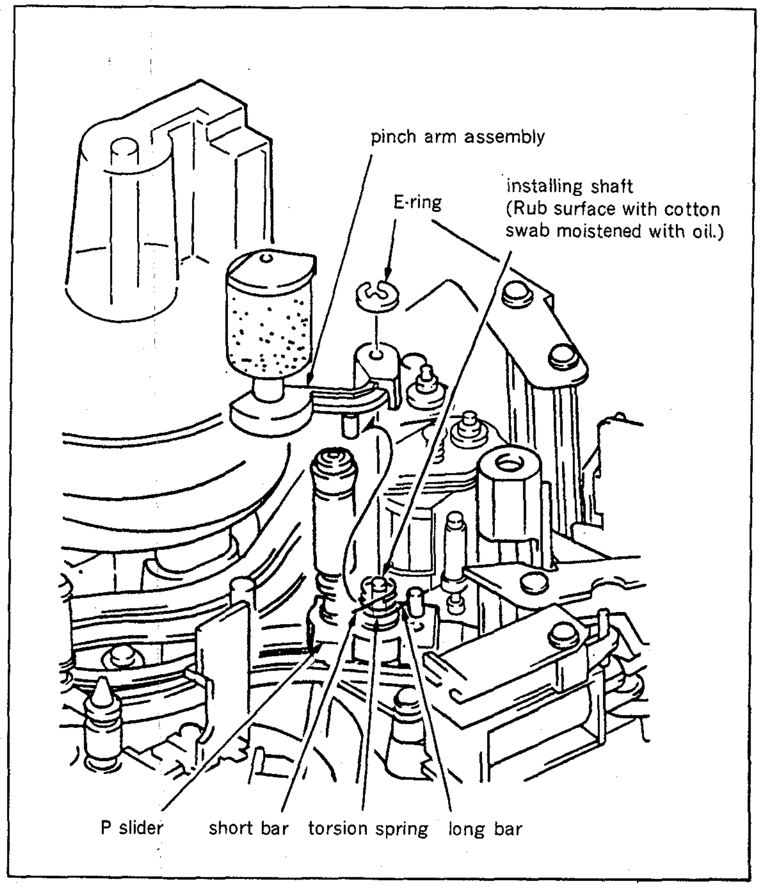
Note 1: Install a spring so that the long bar is to the shaft on the P slider assembly, and the short bar is to the pinch arm assembly.

Note 2: Using tweezers to install the spring will help to easy installation.

7. Push the pinch arm assembly toward the TG-6 tape guide with finger, then release the finger and make sure that it returns smoothly to its original position.
   Clean the new pinch roller with a cleaning piece moistened with cleaning fluid.

Adjustment after replacement

8. Perform confirmation of tape running. (Refer to Section 5-4.)
9. Perform confirmation of video tracking. (Refer to Section 5-5.)
10. Perform confirmation of audio head height. (Refer to Section 5-8.)
11. Perform confirmation of audio head phase. (Refer to Section 5-9.)
12. Perform confirmation of confidence head height. (Refer to Section 5-11.)
13. Perform confirmation of confidence head phase. (Refer to Section 5-12.)



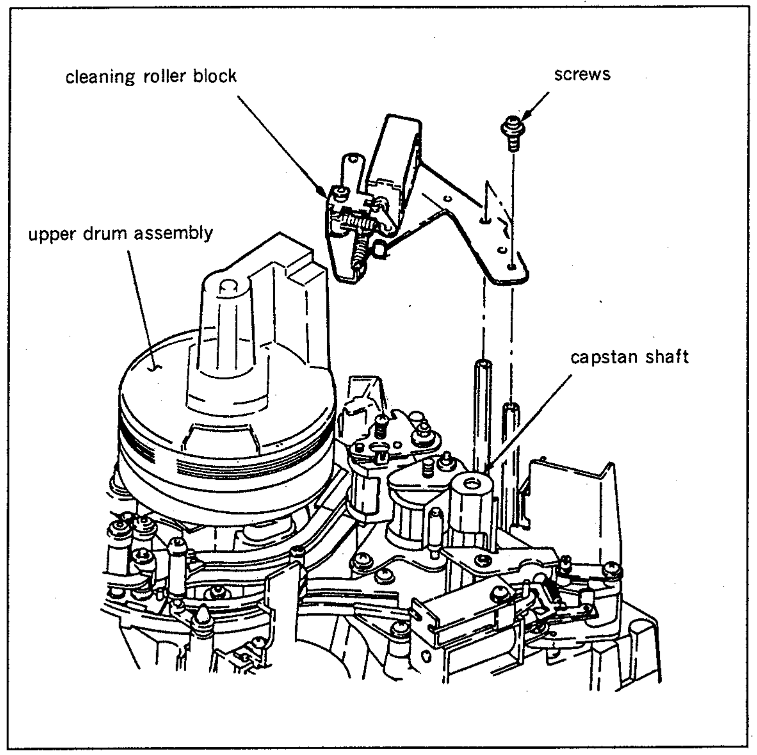
4-6. CLEANING ROLLER ASSEMBLY REPLACEMENT

- The the cleaning roller assembly is a periodic replacement part. It is recommended to replaced periodically based on the periodic maintenance table.

Replacement flow chart

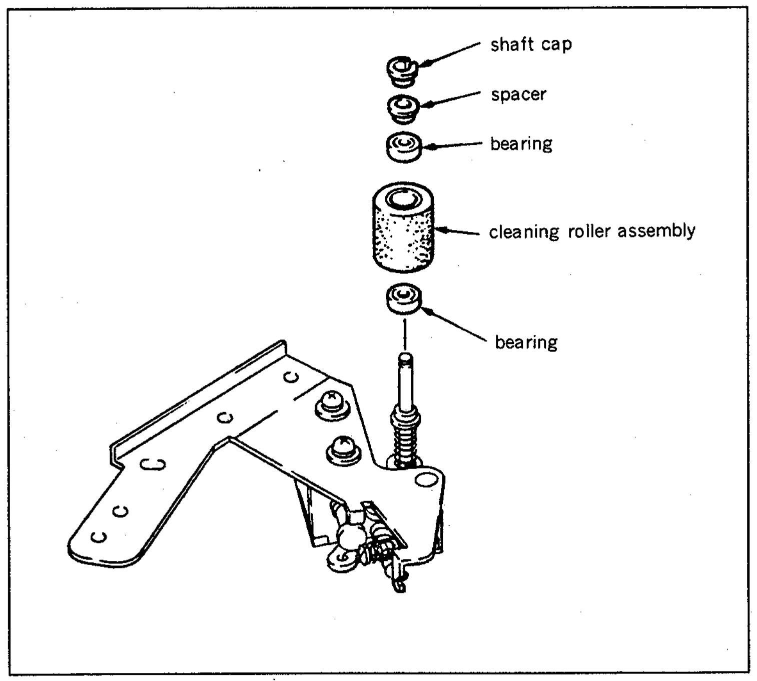
Replacement of cleaning roller assembly

Adjustment of cleaning roller block position



Removal

1. Disconnect a connector of a cleaning solenoid from CN916 on PD-56 board which is positioned on a pinch solenoid block.
2. Remove two screws holding a cleaning roller block, and remove it.
3. Remove a shaft cap of a cleaning roller, and remove a cleaning roller assembly.



Installation

4. Install bearings to the both side of a new cleaning roller assembly, and insert the assembled cleaning roller assembly and a spacer to the shaft in the order as shown in the figure.
5. Install the shaft cap to the top of the shaft.
6. Make sure that the cleaning roller rotates smoothly when rotating the cleaning roller with hand.
7. Install the cleaning roller block to the shafts with two screws snugly, but do not tighten.
8. Connect connector CN916 of the cleaning solenoid on PD-56 board.

Adjustment after replacement

9. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)

4-7. BRAKE LINING ASSEMBLY REPLACEMENT

- When the POWER is OFF, T reel brake lining and S reel brake lining are pressed against the take-up reel table and supply reel table.
  When the POWER is turned ON, the S and T reel brake linings are released.
  The reel brake linings still released even at PLAY, STOP, REW, F.FWD, SEARCH and REV modes.
  Press the EJECT button to put into the EJECT mode. Few seconds later after the EJECT mode is completed, the S and T reel brake linigs are pressed against the reel tables.

Replacement flow chart

Removal of reel table
Replacement of brake lining assembly
Installation of reel table
Confirmation of reel brake clearance
Confirmation of reel brake release amount
Confirmation of reel table height

If the reel brake release amount does not satisfy the specification, and then reel brake release amount adjustment is performed, be sure to perform the following adjustments:

Adjustment of cassette pillar (S) height
Adjustment of reel table height

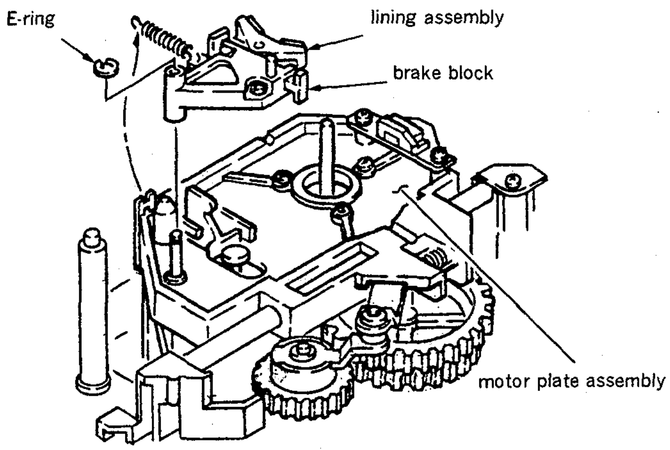
Removal and installation

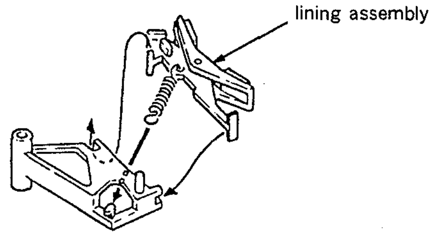
1. Remove a reel table. (Refer to steps from (1) to (6) in Section 4-10.)
2. Unhook a spring of a brake block as shown in the figure from a motor plate assembly.
3. Remove an E-ring that holds the brake block, and remove it.
4. Unhook a spring in the brake block as shown in the figure and remove a lining assembly.
5. Assemble a new lining assembly in the reversing the order of steps (2) to (4).
6. Install the reel table to the reel shaft.

Note : Two fixing screws must be fasten after the reel table height check is completed.

Adjustment after replacement

7. Perform confirmation of reel brake clearance. (Refer to Section 4-7-1.)
8. Perform confirmation of brake release amount. (Refer to steps from (1) to (3) in Section 4-7-2.)
9. Perform confirmation of reel table height. (Refer to stps from (1) to (8) in Section 4-10-2.)



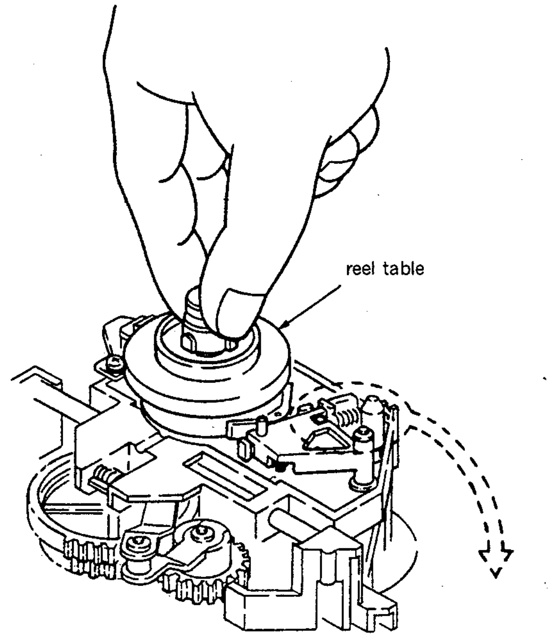


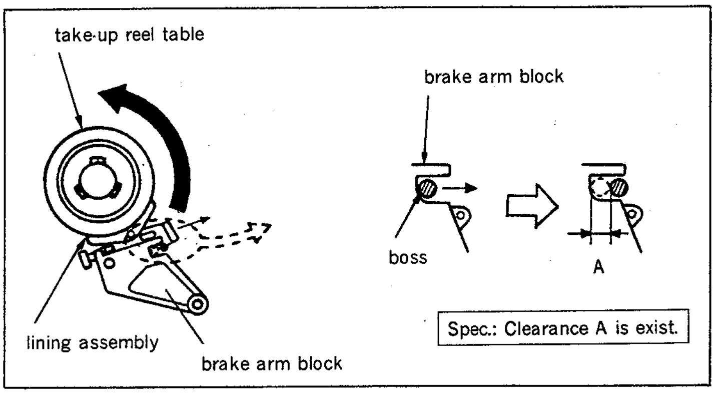
4-7-1. Reel Brake Clearance Check

- Be sure to perform a reel brake clearance check, when the brake lining assembly is removed.

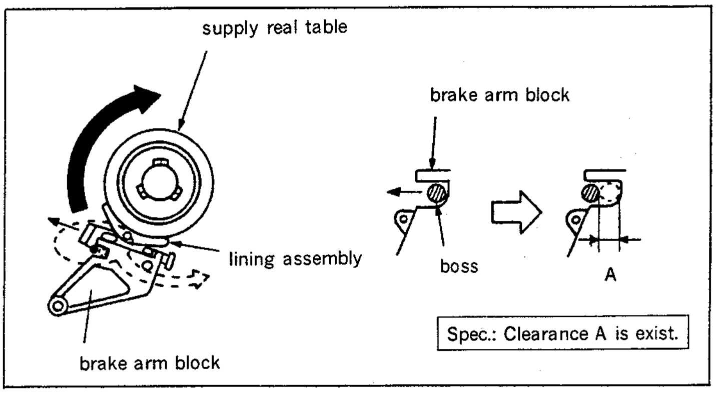
Check

1. Make sure that there is a clearance between a brake arm block and boss when a take-up reel table is turned counterclockwise direction by fingers.
   If there is no clearance, replace the lining assembly.
2. Make sure that there is a clearance between a brake arm block and boss when a supply reel table is turned clockwise direction by fingers.
   If there is no clearance, replace the lining assembly.




take-up reel table
brake arm block
boss
A
lining assembly
brake arm block

Spec.: Clearance A is exist.


supply real table
brake arm block
lining assembly
boss
A
brake arm block

Spec.: Clearance A is exist.

4-7-2. Reel Brake Release Amount Adjustment

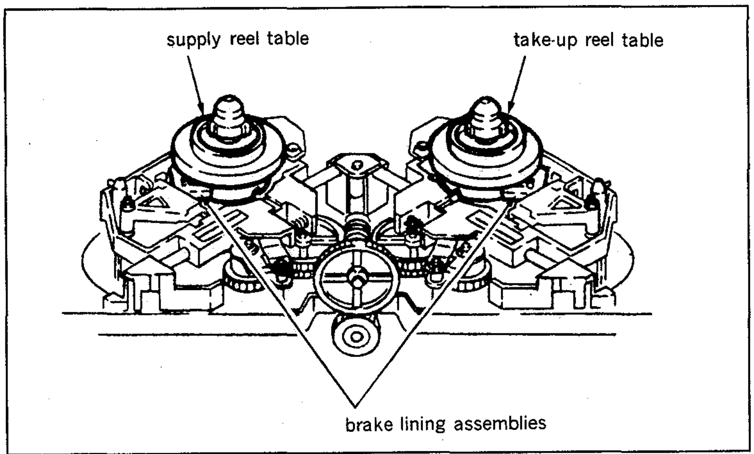
- Be sure to perform a reel brake release amount check, when the brake lining assembly is replaced.
- Be sure to perform a reel brake release amount adjustment, after the brake solenoid is replaced or removed.

Tool

Wire clearance gague : J-6152-450-A

Check

1. Turn the POWER to ON.
2. Make sure that a T brake lining assembly doesn't touch a take-up reel table while the take-up reel table is rotating. (Specification 1) (For reference : clearance is 0.6 to 1.8 mm.) If the specification is not satisfied, perform the adjustment step (4) and later.
3. Make sure that a S brake lining assembly doesn't touch a supply reel table while the supply reel table is rotating. (Specification 2) (For reference : clearance is 0.6 to 1.8 mm.) If the specification is not satisfied, perform the adjustment step (4) and later.

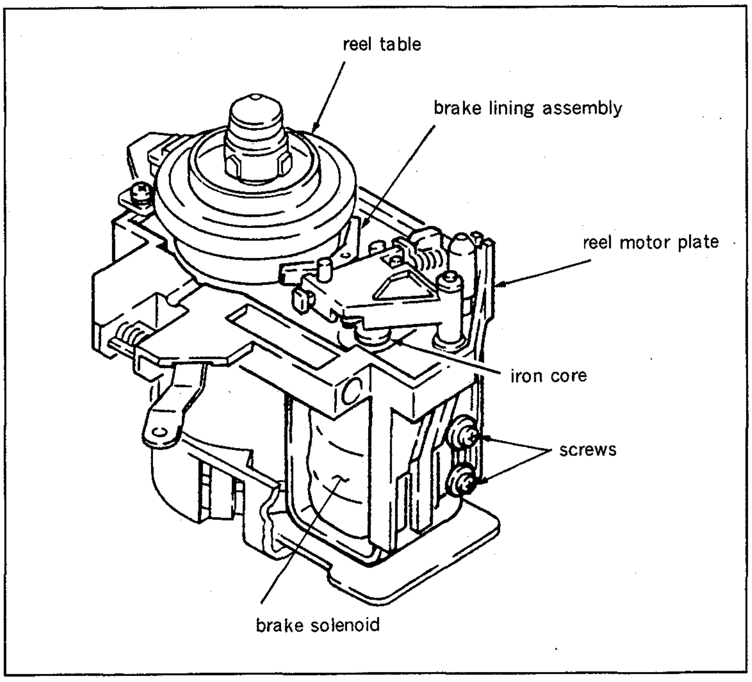


Adjustment

4. Turn the POWER to OFF.
5. Remove a reel motor plate. (Refer to steps from (1) to (6) in Section 4-11.)
6. Loosen two screws which hold a brake solenoid ½ to 1 turn.
7. Adjust the brake solenoid position by pushing down an iron core of the brake solenoid to energized position so that there is a clearance between the reel table and brake liningassembly.

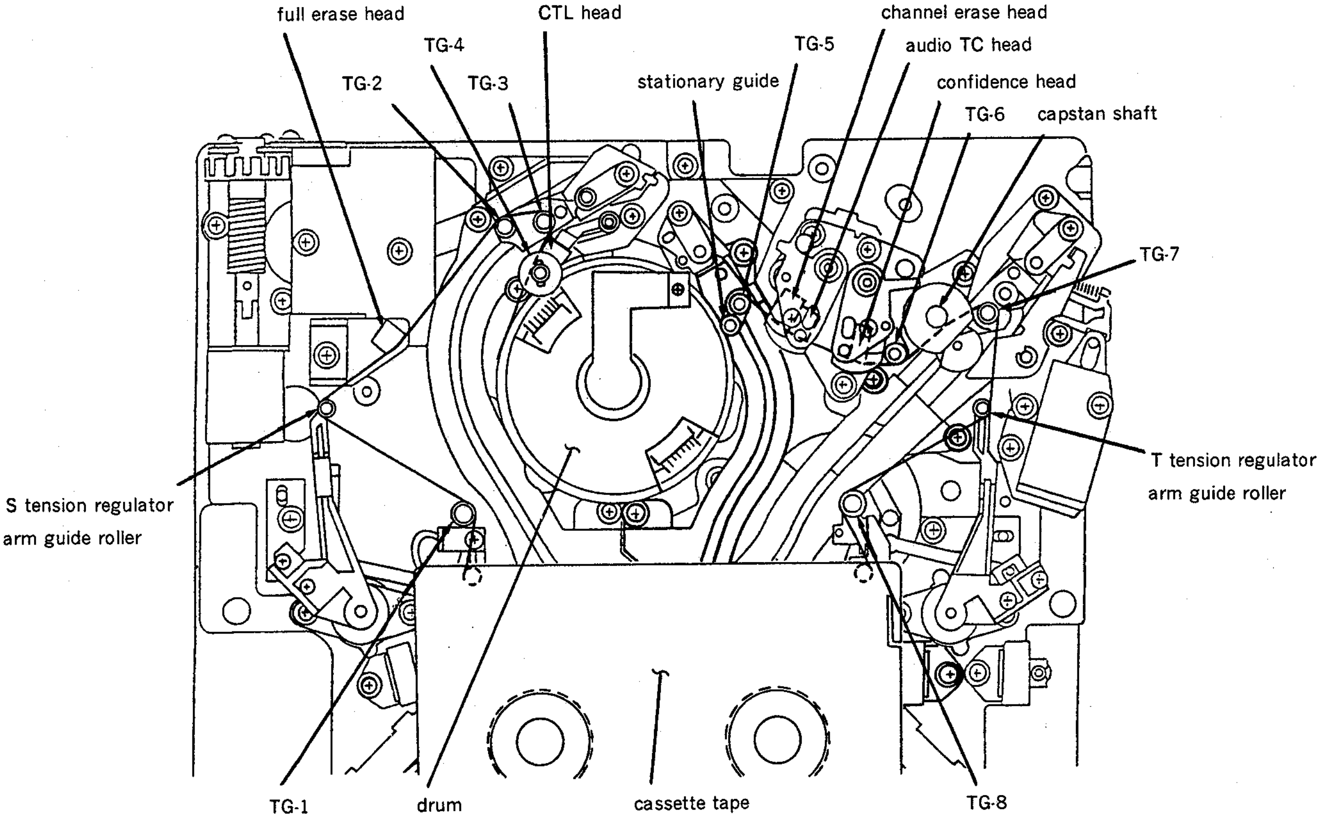
Specification : There is a clearance (0.6 to 1.8 mm) between the reel table and brake linig assembly when the solenoid is energized position.

8. Tighten two fixing screws of the brake solenoid.
9. Reconfirm that there is a clearance between the reel table and brake lining assembly when pushing down the iron core of the break solenoid to energized position.
10. Assemble the reel motor plate in the reversing the order of steps (1) to (6) in Section 4-11.
11. Perform the following adjustment afteradjustment :
    Perform cassette pillar (S) height check. (Refer to steps from (1) to (6) in Section 4-10-1.)
    Perform reel table height check. (Refer to steps from (1) to (8) in Section 4-10-2.)



4-8. TAPE GUIDE REPLACEMENT

- This section describes the replacement procedure for the tape guide roller.
  All the replacement procedures for the tape guide rollers are the same except TG-4 tape guide roller.
- Pay particular attention not to cause damage to the tape guide roller as the tape guide roller touches the tape.


full erase head
CTL head
channel erase head
TG-4
TG-5
audio TC head
TG-2
TG-3
stationary guide
confidence head
TG-6
capstan shaft
TG-7
T tension regulator arm guide roller
S tension regulator arm guide roller
TG-1
drum
cassette tape
TG-8

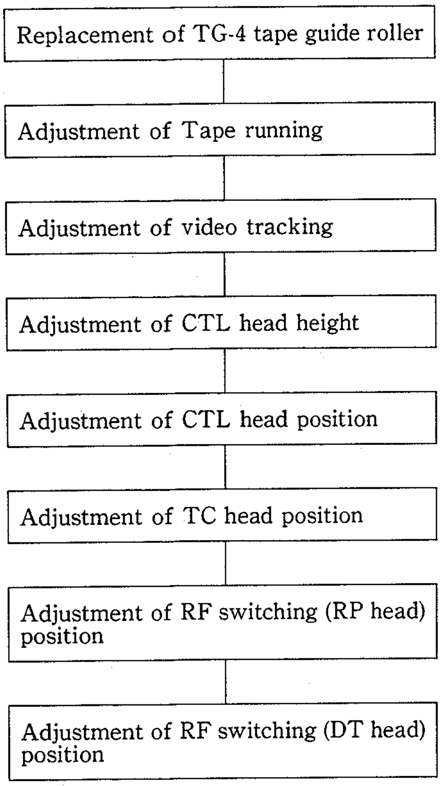
<This figure shows that the unit is in the threading end state.>

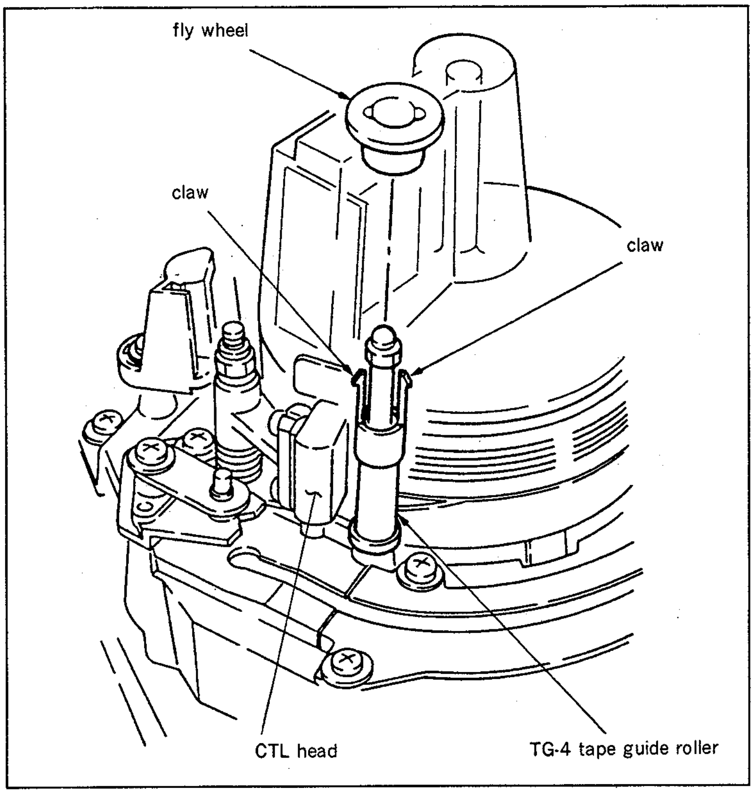
4-8-1. TG-4 Tape Guide Roller Replacement

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01

Replacement flow chart


Replacement of TG-4 tape guide roller
Adjustment of Tape running
Adjustment of video tracking
Adjustment of CTL head height
Adjustment of CTL head position
Adjustment of TC head position
Adjustment of RF switching (RP head) position
Adjustment of RF switching (DT head) position

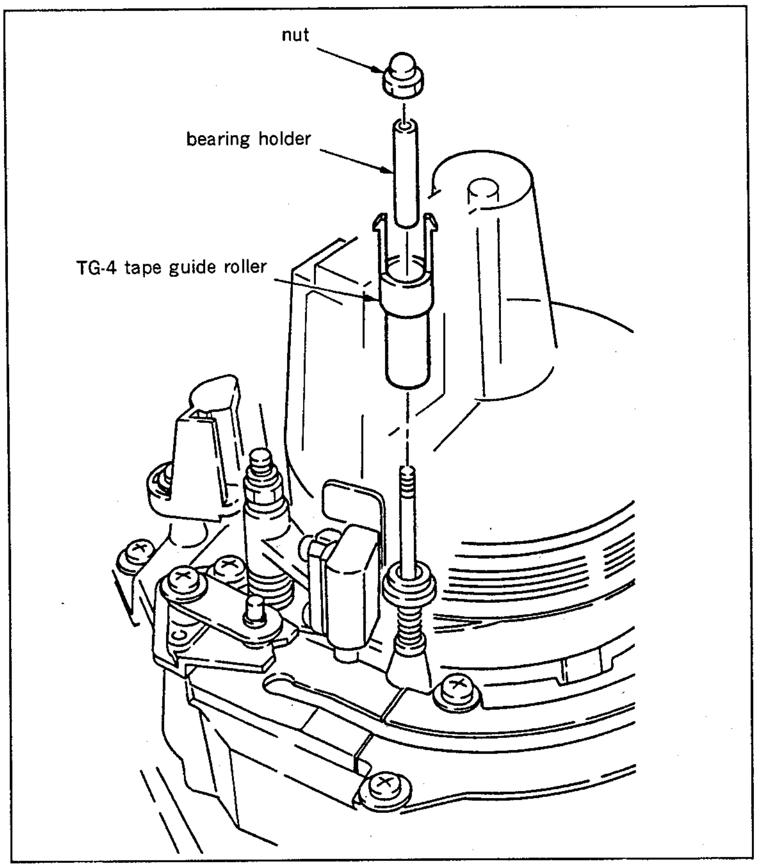

fly wheel
claw
claw
CTL head
TG-4 tape guide roller

Removal

1. Rotate an upper drum assembly by hand, and set the video heads away from a TG-4 tape guide roller.
2. Hold claws of the upper part of the TG-4 tape guide roller using tweezers, and remove a fly wheel.

3. Unscrew a nut on the upper part of the TG-4 tape guide roller, and remove a bearing holder and TG-4 tape guide roller.

Note :Pay particular attention not to cause damage to the upper drum assembly during removal.



Installation

4. Install a new TG-4 tape guide roller and bearing holder, and then tighten the nut.
5. Make sure that the TG-4 tape guide roller rotates smoothly when rotating it by hand.
6. Clean the TG-4 tape guide roller with a cleaning piece moistened with cleaning fluid.
7. Align two claws of the upper part of the TG-4 tape guide roller and the two grooves of the fly wheel, then install the fly wheel to the TG-4 tape guide roller.
   Make sure that the fly wheel is surely locked, after the installation.

Adjustment after replacement

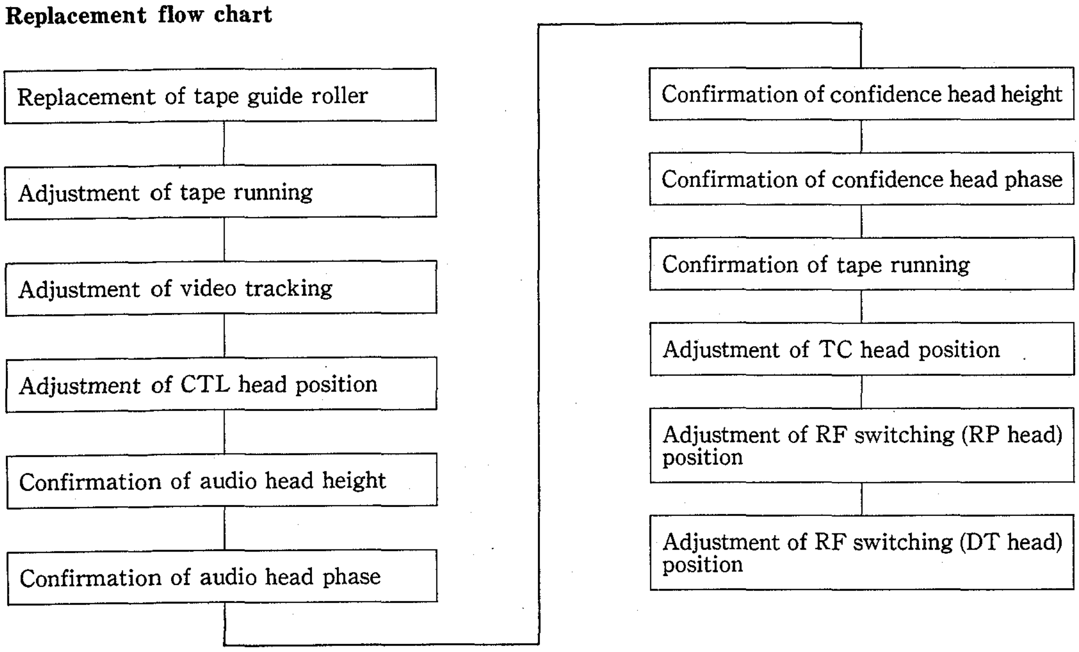
8. Perform tape running adjustment. (Refer to Section 5-4.)
9. Perform video tracking adjustment. (Refer to Section 5-5.)
10. Perform CTL head height adjustment. (Refer to Section 5-6.)
11. Perform CTL head position adjustment. (Refer to Section 5-7.)
12. Perform TC head position adjustment. (Refer to Section 5-14.)
13. Perform RF switching position (RP head) adjustment. (Refer to Section 5-16.)
14. Perform RF switching position (DT head) adjustment. (Refer to Section 5-17.)

4-8-2. Other Tape Guide Rollers Replacement

Tools

Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
Tape guide adjustment driver : J-6321-500-A

Replacement flow chart


Replacement of tape guide roller
Adjustment of tape running
Adjustment of video tracking
Adjustment of CTL head position
Confirmation of audio head height
Confirmation of audio head phase
Confirmation of confidence head height
Confirmation of confidence head phase
Confirmation of tape running
Adjustment of TC head position
Adjustment of RF switching (RP head) position
Adjustment of RF switching (DT head) position

Removal

1. Make sure that the unit is in unthreading end mode.
2. Loosen locking screw of the upper part of the tape guide roller for one to two turns with a tape guide adjustment driver.

Note :Pay particular attention not to cause damage to other tape guide rollers.

3. Rotate an upper flange of the tape guide, and remove it from a tape guide shaft.
4. Remove a tape guide roller.

Installation

5. Install a new tape guide roller and upper flange.

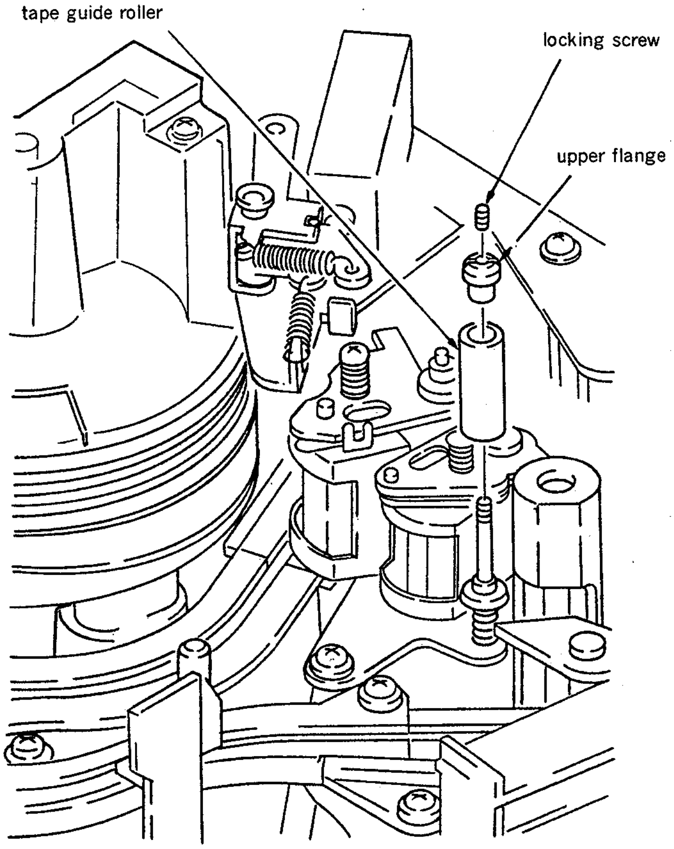
Note :Pay particular attention not to cause damage to other tape guide rollers during installation.

6. Tighten tentatively the locking screw of the upper part of the tape guide with the tape guide adjustment driver.
7. Make sure that the tape guide roller rotates smoothly when rotating the tape guide roller with hand.
8. Clean the tape guide roller, upper flange and lower flange with a cleaning piece moistened with cleaning fluid.

Adjustment after replacement

9. Perform tape running adjustment. (Refer to Section 5-4.)
10. Perform video tracking adjustment. (Refer to Section 5-5.)
11. Perform CTL head position adjustment. (Refer to Section 5-7.)
12. Perform confirmation of audio head height. (Refer to Section 5-8.)
13. Perform confirmation of audio head phase. (Refer to Section 5-9.)
14. Perform confirmation of confidence head height. (Refer to Section 5-11.)
15. Perform confirmation of confidence head phase. (Refer to Section 5-12.)
16. Perform confirmation of tape running. (Refer to Section 5-4.)
17. Perform TC head position adjustment. (Refer to Section 5-14.)
18. Perform RF switching position (RP head) adjustment. (Refer to Section 5-16.)
19. Perform RF switching position (DT head) adjustment. (Refer to Section 5-17.)

<Illustration shows TG-6 tape guide>



4-9. CLEANING SOLENOID REPLACEMENT

Replacement flow chart

Replacement of cleaning solenoid

Adjustment of cleaning roller block position

Removal

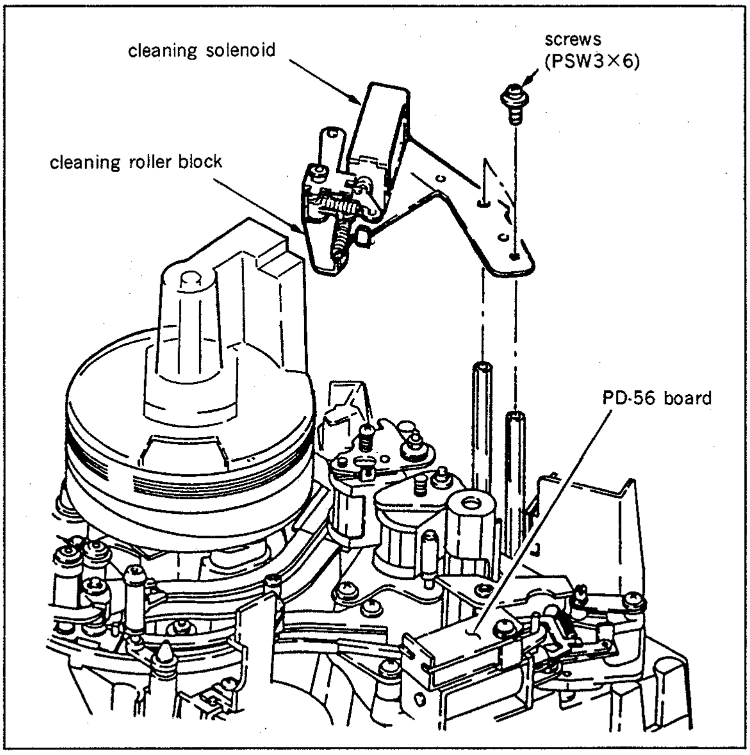
1. Disconnect connector of a cleaning solenoid from CN916 on PD-56 board which is positioned on a pinch solenoid block.
2. Remove two screws (PSW3×8) holding a cleaning roller block, and remove the cleaning roller block.
3. Remove two screws (PS2.6×4) and washers holding the cleaning solenoid, and remove the cleaning solenoid.

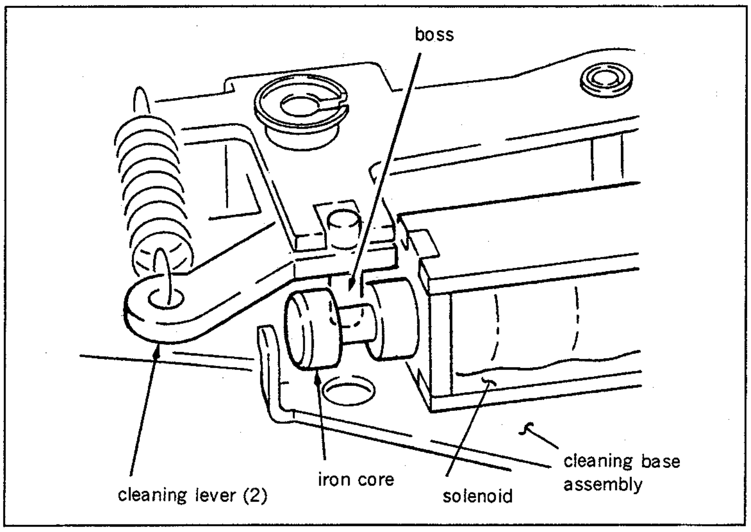
Installation

4. Install a new solenoid to a cleaning base assembly with two washers and screws (PS2.6×4) while inserting a boss of a cleaning lever (2) into the groove of an iron core of the solenoid.
5. Tighen the cleaning roller block to the studs with two screws (PSW3×8), but do not tighten.
6. Connect the connector CN916 of the cleaning solenoid to PD-56 board.

Adjustment after replacement

7. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)


cleaning solenoid
screws
(PSW3×6)
cleaning roller block
PD-56 board


boss
cleaning lever (2)
iron core
solenoid
cleaning base assembly

4-10. REEL TABLE REPLACEMENT

Tools

Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
L shaped wrench (across flat has 1.5 mm) : 7-700-736-05

Replacement flow chart

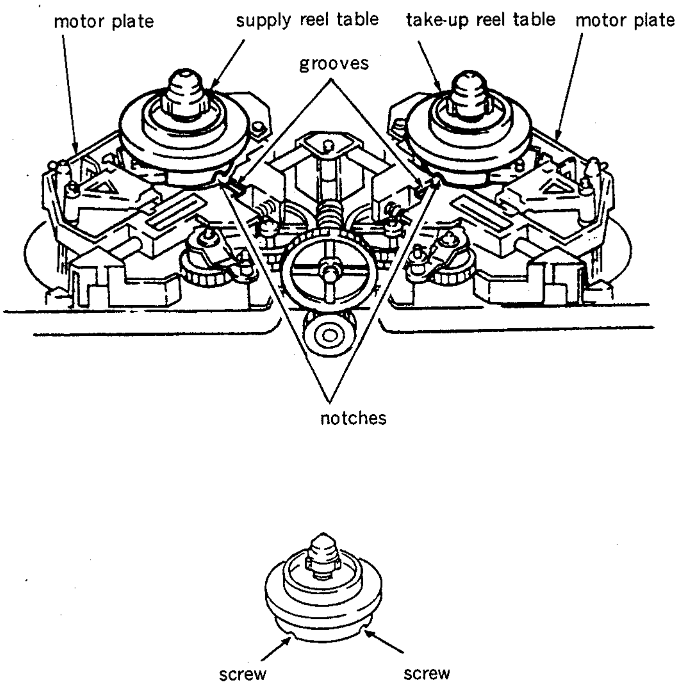
Replecement of reel table

Confirmation of cassette pillar (S) height

Adjustment of reel table height

Confirmation of reel rotation detector position

Adjustment of reel FG duty



Removal

1. Align one of the notch at the lower part of a reel table to a groove of a motor plate by rotating the reel table by hand.
2. Insert the L shaped wrench along with the groove of the motor plate, and put it into the screw hole at the lower part of the reel table.
3. Loosen a fixing screw of the reel table for two to three turns.
4. Rotate the reel table more, and align the other notch at the lower part of the reel table to the groove of the motor plate.
5. Repeat the above steps (2) and (3) in order to loosen the fixing screw of the reel table.
6. Remove the reel table from the motor plate assembly.

Note :A polyslider washer for reel table height adjustment is inserted at the lower part of the bearing of the reel table.
Pay particular attention not to lose the polyslider washer when removing the reel table as the polyslider washer may be stuck with the lower part of the reel table.

Installation

7. Clean a new reel table with a cleaning piece moistened with cleaning fluid, and install it to a reel motor shaft.

Note :Tighten two fixing screws after the reel table height check is performed.

Adjustment after replacement

8. Perform confirmation of cassette pillar (S) height. (Refer to steps from (1) to (6) in Section 4-10-1.)
9. Perform reel table height adjustment. (Refer to Section 4-10-2.)
10. Perform reel rotation detector position adjustment. (Refer to steps from (1) to (5) in Section 4-10-3.)
11. Perform reel FG duty adjustment. (Refer to Section 4-12-3.)

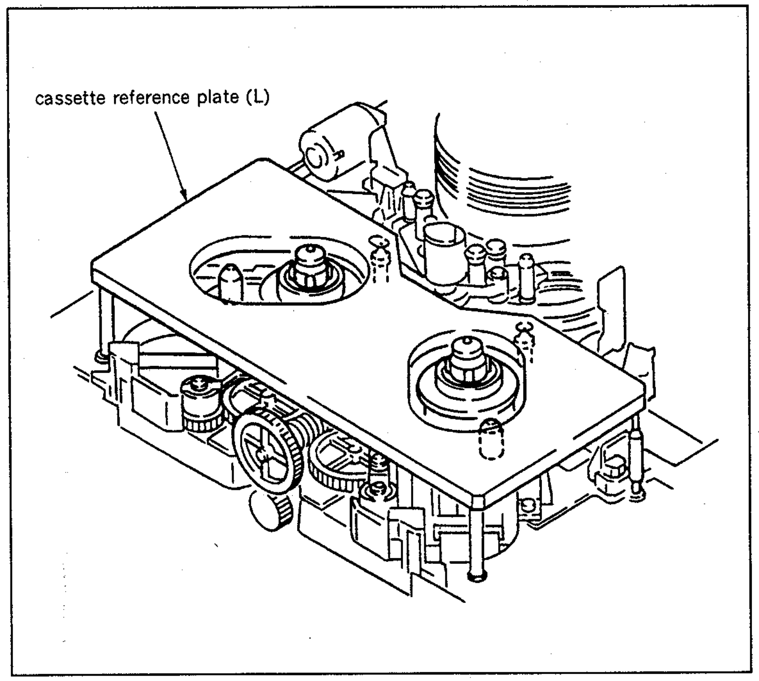
4-10-1. Cassette Pillar (S) Height Adjustment

Tools

Cassette reference plate (L) : J-6320-880-A
Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
Adjustment mirror : J-6080-029-A
L shaped wrench (across flat has 1.5 mm) : 7-700-736-05

Check

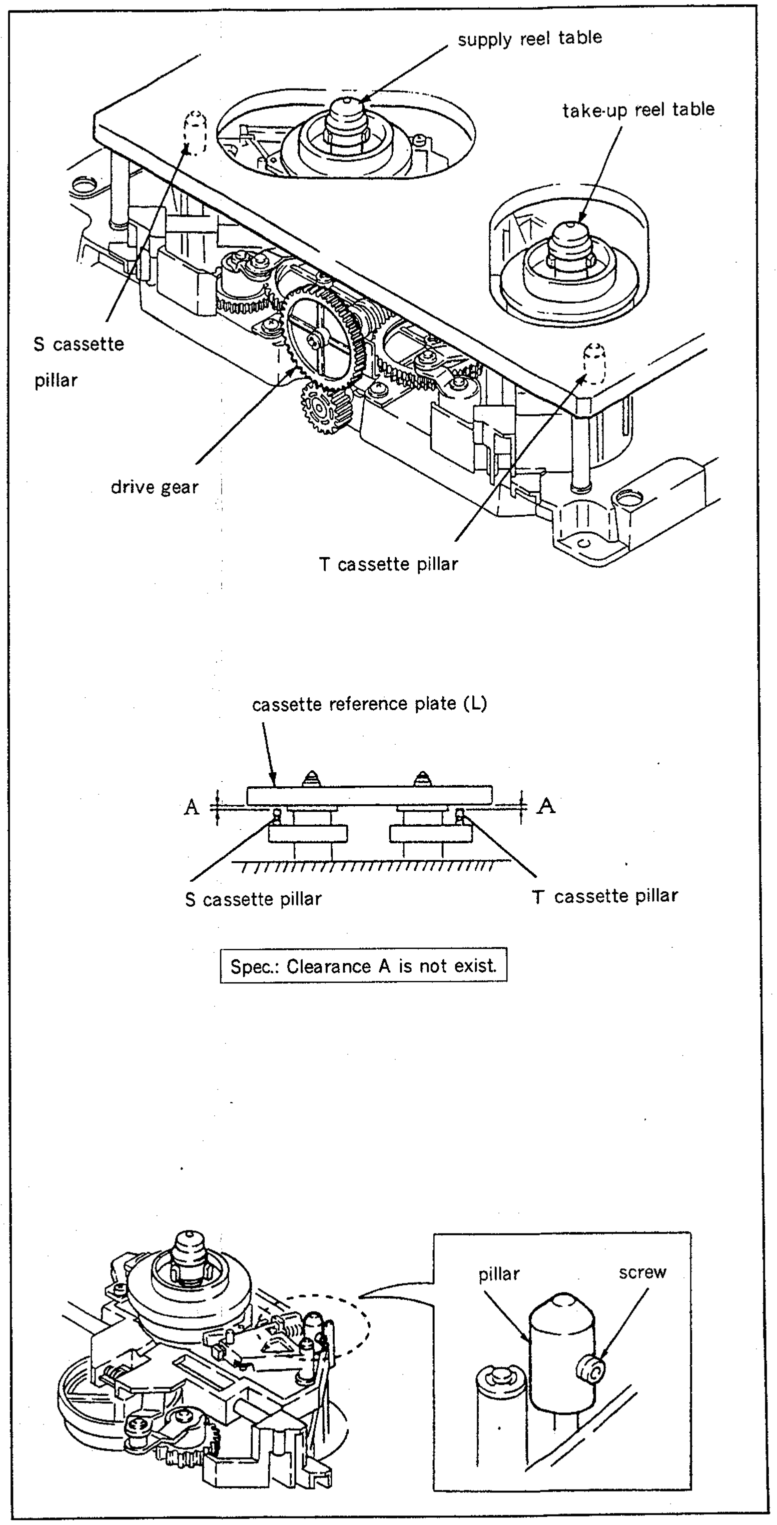
1. Make sure that the unit is in unthreading end mode.
2. Clean surface of the cassette reference plate (L) with a cleaning piece moistened with cleaning fluid.
3. Place the cassette reference plate (L) on four cassette pillars.



4. Place the supply and take-up reel tables to the intermediate position between S cassette position and L cassette position by rotating a drive gear by fingers as shown in the figure. Make sure that the S cassette pillar and T cassette pillar are positioned under the cassette reference plate (L) as shown in the figure. (The S cassette pillar and T cassette pillar should not be seen from the upper part of the unit.)
5. Turn over the cassette reference plate (L) and place it on four cassette pillars.
6. Check with adjustment mirror that there are no clearances between the cassette reference plate (L) and S cassette pillar, and T cassette pillar.
   If the specifications are not satisfied, perform the following adjustment.

Adjustment

7. Loosen a fixing screw of the S cassette pillar and/or T cassette pillar 1/2 to one turn with the L shaped wrench.
8. Lift the S cassette pillar and/or T cassette pillar, and contact it with the cassette reference plate (L).
   Tighten a fixing screw with L shaped wrench under this condition.
9. Make sure that the specification is satisfied.



4-10-2. Reel Table Height Adjustment

- This adjustment is not necessary in general, however, perform when a reel motor is replaced or a reel table is removed or replaced.
- Pay particular attention to perform this adjustment as it is to be the reference for the tape running system.

Tools

Cassette reference plate (L): J-6320-880-A
Reel table height gauge : J-6320-680-A
Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
L shaped wrench (across flat has 1.5 mm) : 7-700-736-05

Check

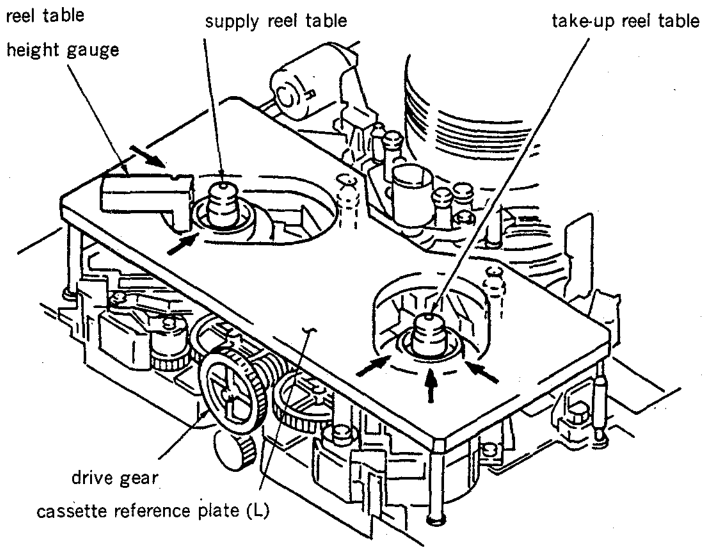
1. Make sure that the unit is in unthreading end mode.
2. Rotate a drive gear by fingers so that a reel table is placed to the L cassette position.
3. Clean the surface of the cassette reference plate (L) with a cleaning piece moistened with cleaning fluid.
4. Place the cassette reference plate (L) on four cassette pillars.
5. Clean the surface of the reel table height gauge with a cleaning piece moistened with cleaning fluid.
6. Move the reel table heigh gauge from three directions of arrows towards supply reel table or take-up reel table, and make sure that the specificaions are satisfied.

Specification 1 : * marked portion (passing side) as shown in the figure of the gauge runs over the flange of the reel table.

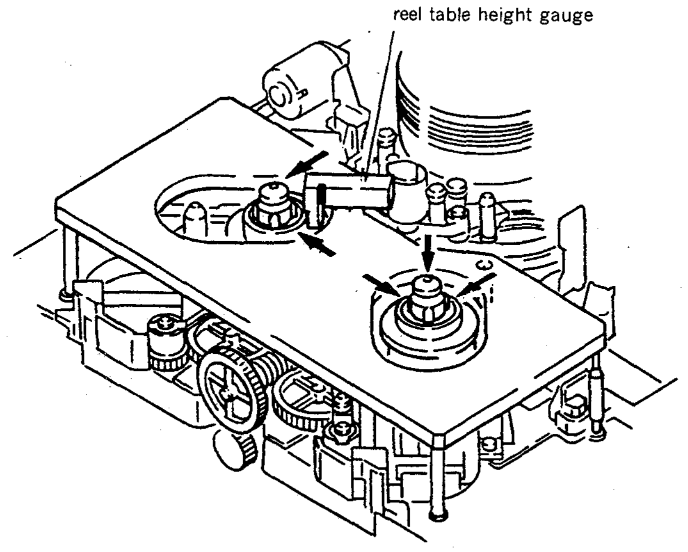
Specification 2 : * * marked portion (no passing side) as shown in the figure of the gauge is blocked at the flange of the reel table.

7. Rotate the drive gear by fingers so that the reel table is placed to the S cassette position.
8. Perform step (6) and make sure that the specifications are satisfied.
   If any specification is not satisfied, perform step (9) and later, and repeat the adjustment at both L cassette position and S cassette position until the specifications are satisfied.
   If the specification is satisied, at both positions, perform step ⑪ and later.

<L cassette position>

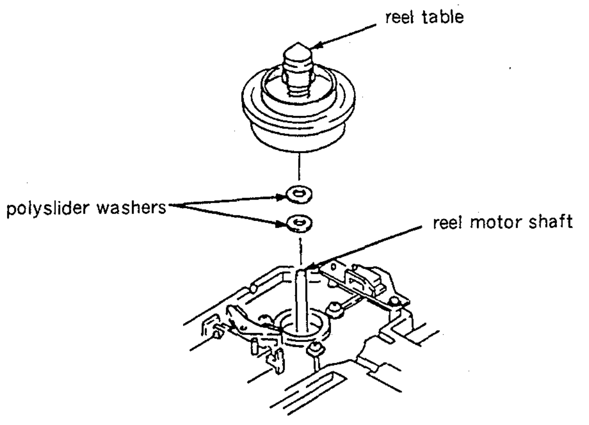


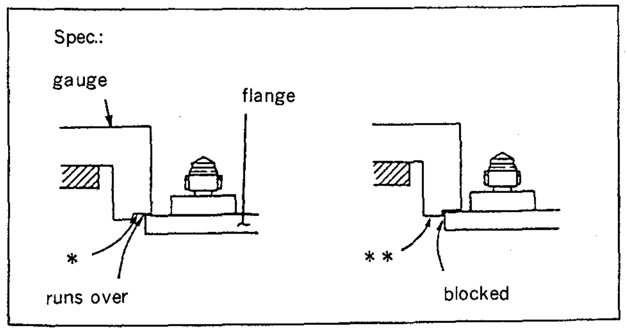
<S cassette position>



Adjustment

9. Remove the reel table.
10. Adjust the height of the reel table with polyslider washer installed into the reel motor shaft until the specifications are satisied at both L cassette position and S cassette position.
    Polyslider washer for adjustment use:
    4 mm dia. 0.13 mm thick : Part No. 3-701-441-01
    4 mm dia. 0.25 mm thick : Part No. 3-701-441-11
    4 mm dia. 0.5 mm thick : Part No. 3-701-441-21
11. After step ⑩ is completed, remove the supply and take-up reel tables tentatively, and add one polyslider washer below the reel tables respectively.
    - Under supply reel table : 0.25 mm thick polyslider washer
    - Under take-up reel table : 0.13 mm thick polyslider washer
12. Tighten two fixing screws of the reel table with the L shaped wrench while pressing the supply reel table and/or take-up reel table slightly towards down. (Refer to steps from (1) to (5) in Section 4-10.)





4-10-3. Reel Rotation Detector Position Adjustment

- Be sure to perform this adjustment when a reel rotation detector is replaced.
- Be sure to perform the confirmation when a reel motor and/or reel table is replaced.
- Adjustment of a supply reel rotation detector and take-up reel rotation detector take the same procedure.

Tools

Oscilloscope

Wire clearance gauge : J-6152-450-A

Check

1. Connect the oscilloscope to PD-56 board on a pinch solenoid block as follows :
   S : TP1/PD-56 board
   T : TP2/PD-56 board
2. Put Bit7 of S601 on SS-48DP board in CLOSE state.
3. Turn the POWER to ON.
4. Press S602 on SS-48DP board. (Reel table begins to rotate.)
5. Make sure that the test point output satisfies the specification 1.
   Make sure that a clearance between a reel table and reel rotation detector satisfies the specification 2.

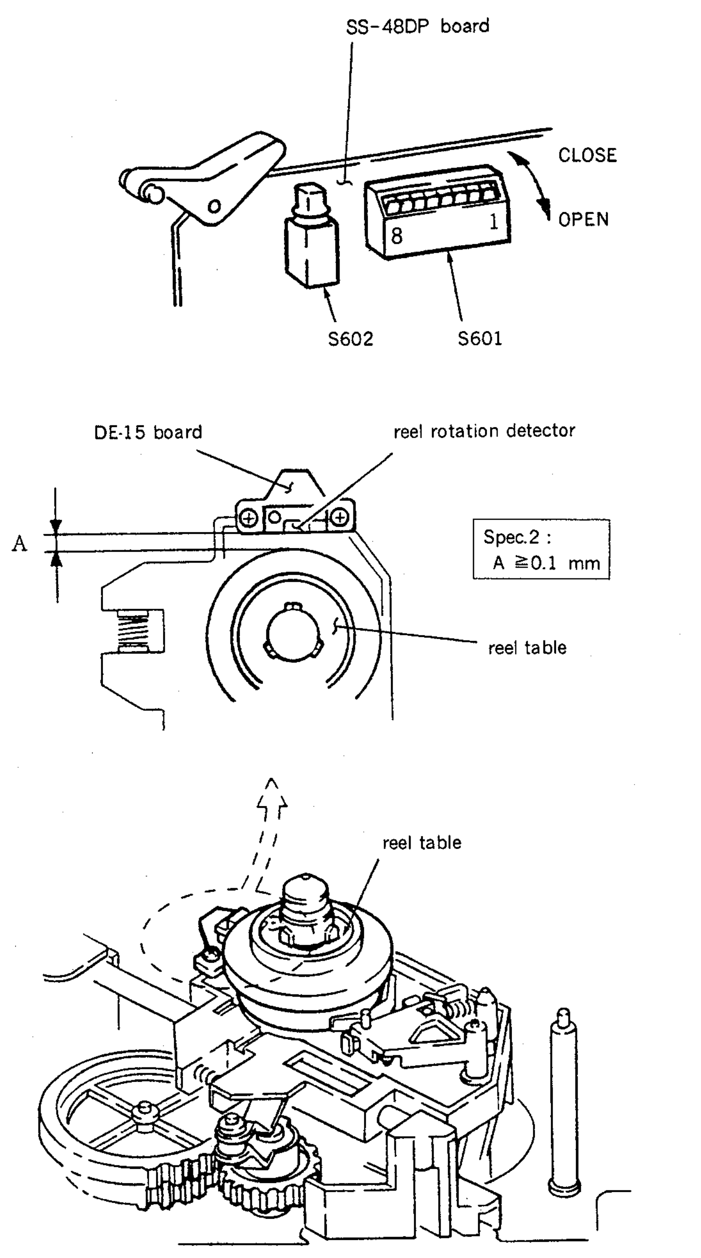
Specification 1 : No distortion in the waveform as well as 0.4 Vp-p or more.

Specification 2 : A clearance between the reel table and reel rotation detector is more than 0.1 mm.

When both specifications 1 and 2 are satisfied, perform step (6) and later.

When either specifications 1 or 2 is not satisfied, perform step (17) and later.

6. Turn the POWER to OFF.
7. Turn the POWER to ON again, and press S302 and put the unit into maintenance mode.
8. Press the search dial to enter the jog mode, and move * mark to "B0: SERVO CHECK" which is dispalying on the monitor screen.
9. Press S302 on SS-48DP board to select "SERVO CHECK" mode.
10. Move * mark to "B02: MOTOR CHECK" which is dispalying on the monitor screen with the search dial.
11. Press S302 on SS-48DP board to select "MOTOR CHECK" menu.
12. Move * mark to "B021 : S REEL" or "B022 : T REEL" which is dispalying the sub-menu on the monitor screen with the search dial.
13. Press S302 on SS-48DP board and execute "S REEL" or "T REEL" sub-menu.
14. When the search dial rotates in the jog mode, make sure that the test point output satisfies the specification 3.



Specification 3 : 0.4 Vp-p or more (no distortion)

If the specification 3 is satisfied, perform step (15) and later.

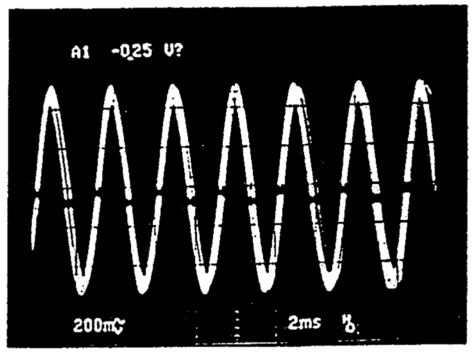
If the specification 3 is not satisfied, perform step (17) and later.

15. Turn the POWER to OFF.
16. Put Bit7 of S601 on SS-48DP board in OPEN state.

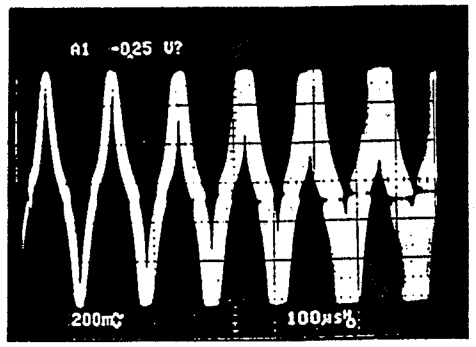
Adjustment

17. Loosen a fixing screw of DE-15 board holding the reel rotation detector for one to two turns.
18. Insert the paper which two folded such as of this service manual between the reel table and reel rotation detector, and press the reel rotation detector slightly towards the reel table. Then tighten a fixing screw.
19. Pull out the folded paper, and make sure that a sheet of paper is easily inserted in this space.
20. Perform the check procedures and make sure that all of the three specifications 1 to 3 are satisfied.
    If all of the three specifications are not satisfied, adjust the position of DE-15 board again.
21. Perform reel FG duty adjustment.
    (Refer to Section 4-12-3.)

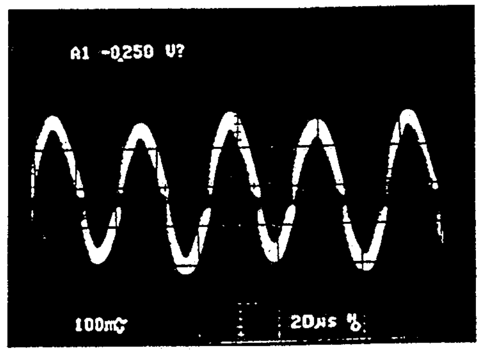
OK



NG
narrower clearance



NG
wider clearance



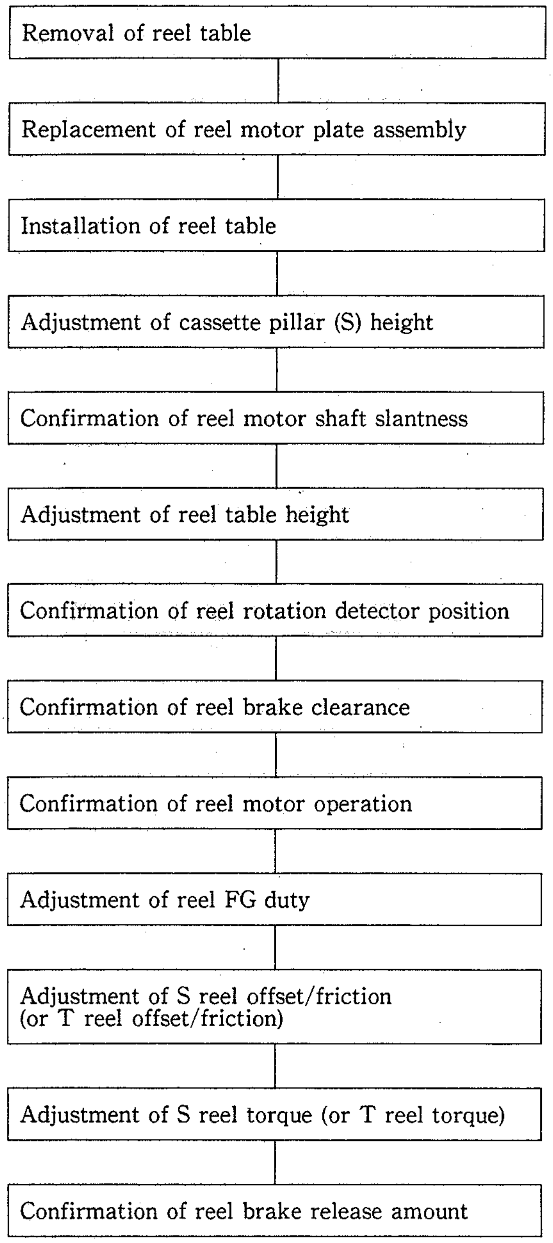
4-11. REEL MOTOR PLATE REPLACEMENT

- Replacement of supply reel motor plate and take-up reel motor plate take the same procedure.

Tools

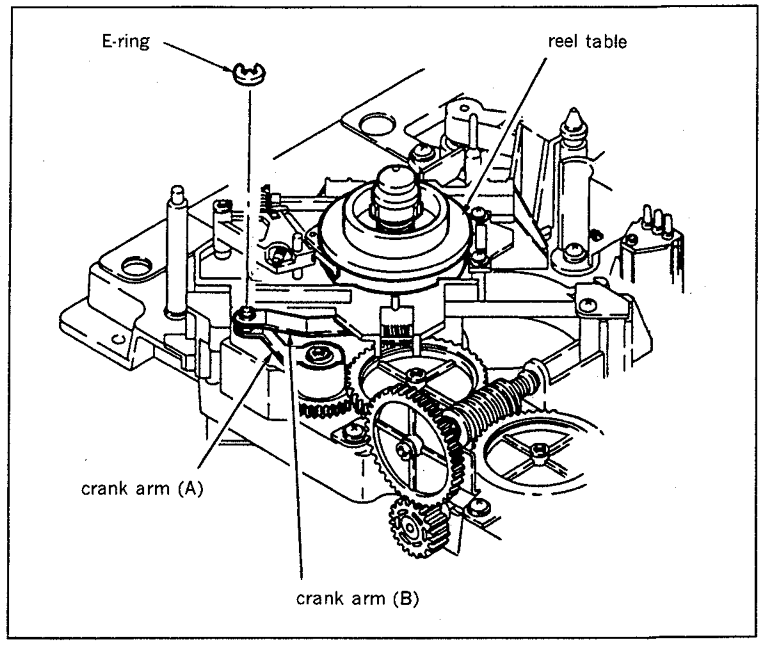
Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
L shaped wrench (across flat has 1.5 mm)	: 7-700-736-05
Grease (SGL-505)	: 7-662-010-04

Replacement flow chart


Removal of reel table
Replacement of reel motor plate assembly
Installation of reel table
Adjustment of cassette pillar (S) height
Confirmation of reel motor shaft slantness
Adjustment of reel table height
Confirmation of reel rotation detector position
Confirmation of reel brake clearance
Confirmation of reel motor operation
Adjustment of reel FG duty
Adjustment of S reel offset/friction (or T reel offset/friction)
Adjustment of S reel torque (or T reel torque)
Confirmation of reel brake release amount

Removal

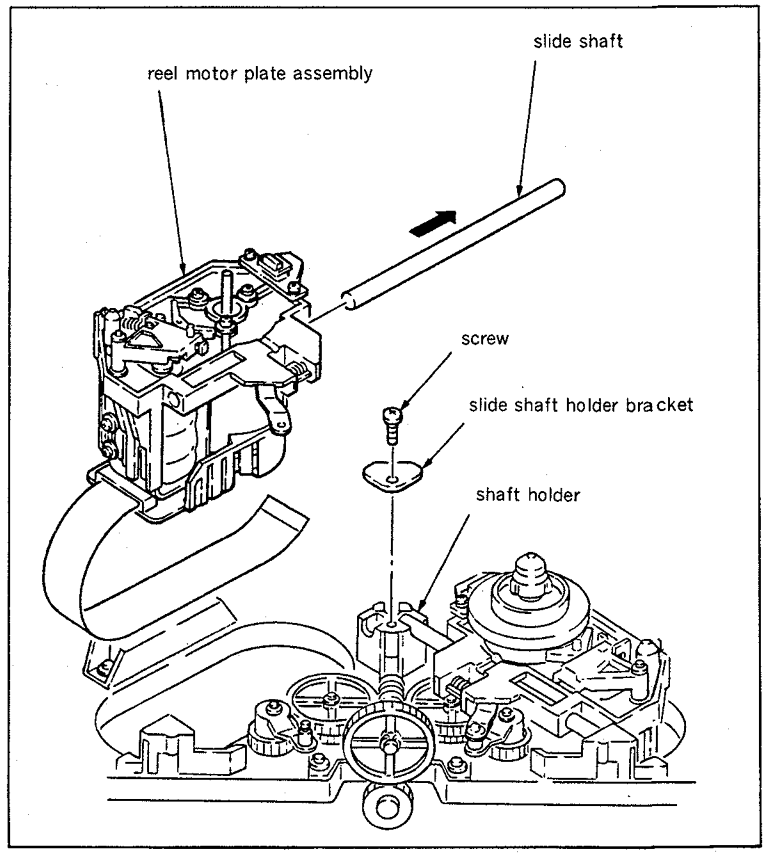
1. Disconnect a flat cable of a reel motor board (RM-82 board) connected with DR-118B board.
2. Remove an E-ring holding a crank arm (B) of a reel motor plate assembly.
3. Remove a reel table. (Refer to the steps from (1) to (6) in Section 4-10.)


E-ring
reel table
crank arm (A)
crank arm (B)

4. Remove a screw shown in the figure, and remove a slide shaft holder bracket.
5. Push a slide shaft towards the direction of arrow and remove it from the reel motor plate assembly.

Note :Pay particular attention not to cause damage to the slide shaft during removal.

6. Lift the reel motor plate assembly, and disconnect the flat cable of the reel motor board (RM-82 board).


slide shaft
reel motor plate assembly
screw
slide shaft holder bracket
shaft holder

Installation

7. Clean the hole where the slide shaft to be inserted of a new reel motor plate assembly with a cleaning piece moistened with cleaning fluid.
8. Clean the slide shaft with a cleaning piece moistened with cleaning fluid.

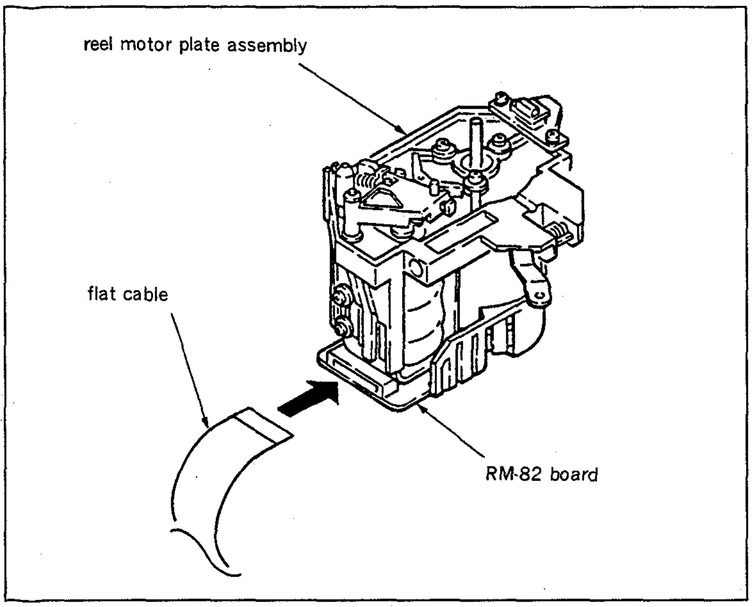
9. Connect the flat cable to the connector of RM-82 board of the new reel motor plate assembly.
10. Insert the slide shaft to the reel motor plate assembly and install it to the unit.

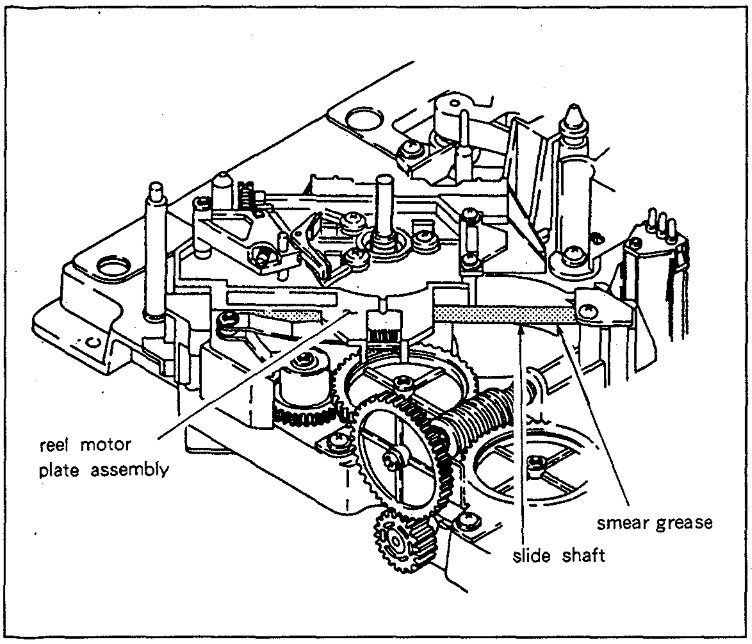
Note :Pay particular attention not cause damage to the slide shaft during installation.

11. After putting the slide shaft into a shaft holder, install the slide shaft bracket with a screw.
    Smear grease very lightly to the place of the slide shaft shown in the figure.
13. Make sure that the reel motor plate assembly moves smoothly when moving it by hand towards S cassette and L cassette positions.
14. Install the crank arm Ⓑ to a crank arm Ⓐ on the chassis with an E-ring.
15. Install the reel table to a reel shaft.

Note :Tighten two fixing screws after the adjustment of reel table height.

16. Connect the flat cable of the reel motor board (RM-82 board) with DR-118B board.





Adjustment after replacement

17. Perform cassette pillar (S) height adjustment. (Refer to Section 4-10-1.)
18. Perform confirmation of reel motor shaft slantness adjustment. (Refer to steps from (1) to (7) in Section 4-12-1.)
19. Perform reel table height adjustment. (Refer to Section 4-10-2.)
20. Perform confirmation of reel rotation detector position adjustment. (Refer to steps from (1) to (14) in Section 4-10-3.)
21. Perform confirmation of reel brake clearance adjustment. (Refer to Section 4-7-1.)
22. Perform confirmation of reel motor operation. (Refer to Section 4-12-2).
23. Perform reel FG duty adjustment. (Refer to Section 4-12-3.)
24. Perform S reel offset/friction (or T reel offset/friction) adjustment. (Refer to Section 4-12-4 or 4-12-6.)
25. Perform S reel torque (or T reel torque) adjustment. (Refer to Section 4-12-5 or 4-12-7.)
26. Perform confirmation of reel brake release amount adjustment. (Refer to steps from (1) to (3) in Section 4-7-2.)

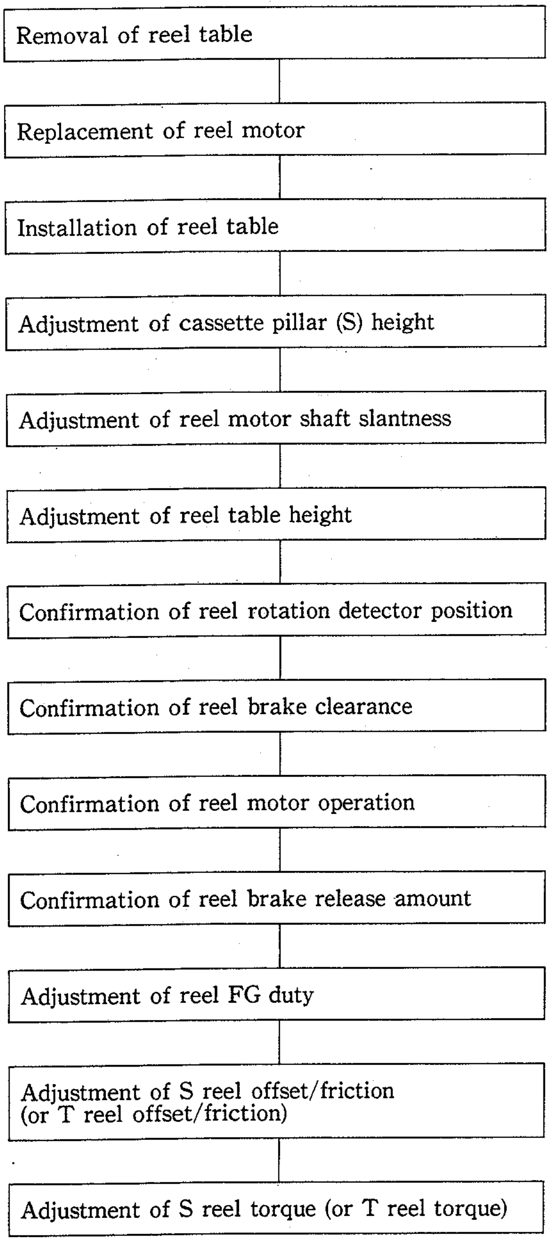
4-12. REEL MOTOR REPLACEMENT

- Replacement of supply reel motor and take-up reel motor take the same procedure.
- Perform the replacement of a reel motor as an assembled part instead of as a component part.

Tools

Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
L shaped wrench (across flat has 1.5 mm)
: 7-700-736-05

Replacement flow chart


Removal of reel table
Replacement of reel motor
Installation of reel table
Adjustment of cassette pillar (S) height
Adjustment of reel motor shaft slantness
Adjustment of reel table height
Confirmation of reel rotation detector position
Confirmation of reel brake clearance
Confirmation of reel motor operation
Confirmation of reel brake release amount
Adjustment of reel FG duty
Adjustment of S reel offset/friction (or T reel offset/friction)
Adjustment of S reel torque (or T reel torque)

Removal

1. Remove a reel table. (Refer to steps from (1) to (6) in Section 4-10.)
2. Disconnect a flat cable of a reel motor board (RM-82 board) connected with DR-118 board.
3. Disconnect three connectors CN923, CN926 and CN927 of the reel motor board (RM-82 board).
4. Remove three screws (PSW3×10) shown in the figure, and remove a reel motor assembly.

Note 1 : Hold the reel motor assembly to avoid dropping.

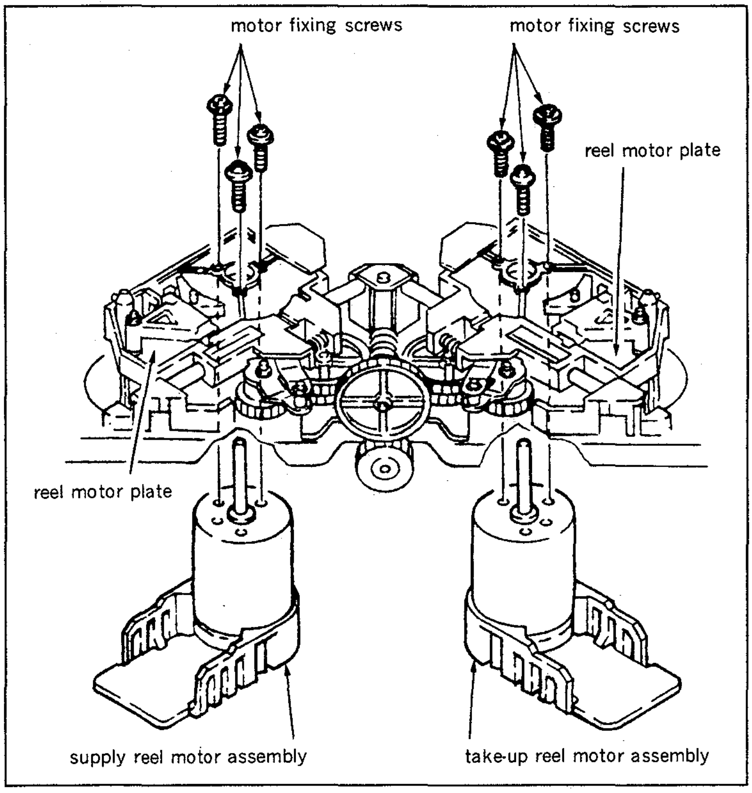
Note 2 : Pay particular attention not to lose the spacer using for slantness adjustment since it comes off with the reel motor assembly when its removal.

5. Remove a polyslider washer which is used for the reel table height adjustment from the reel motor shaft.

Installation

6. Clean the surfaces of a new reel motor assembly and reel motor plate assembly with a cleaning piece moistened with cleaning fluid.
7. Install the new reel motor assembly as in the direction shown in the figure with three screws (PSW3×10).
8. Install the polyslider washer which is removed in step (5) to the reel motor shaft.
9. Connect three connectors CN923, CN926 and CN927 to RM-82 board.
10. Insert the flat cable to RM-82 board.
11. Install the reel table to the reel motor shaft.

Note : Tighten two screws after adjustment of the reel table height.



Adjustment after replacement

12. Perform confirmation of cassette pillar (S) height adjustment. (Refer to steps from (1) to (6) in Section 4-10-1.)
13. Perform reel motor shaft slantness adjustment. (Refer to Section 4-12-1.)
14. Perform reel table height adjustment. (Refer to Section 4-10-2.)
15. Perform confirmation of reel rotation detector position adjustment. (Refer to steps from (1) to (14) in Section 4-10-3).
16. Perform confirmation of reel brake clearance. (Refer to Section 4-7-1.)
17. Perform confirmation of reel motor operetion. (Refer to Section 4-12-2.)
18. Perform confirmation of reel brake release amount.
    (Refer to steps (1) to (3) in Section 4-7-2.)
19. Perform reel FG duty adjustment.
    (Refer to Section 4-12-3.)
20. Perform S reel offset/friction (or T reel offset/friction) adjustment.
    (Refer to Section 4-12-4 or 4-12-6.)
21. Perform S reel torque (or T reel torque) adjustment. (Refer to Section 4-12-5 or 4-12-7.)

4-12-1. Reel Motor Shaft Slantness Adjustment

- Supply reel motor shaft slantness adjustment and take-up reel motor shaft slantness adjustment take the same procedure.
- This adjustment is not necessary in general, however, be sure to perform it when a reel motor and reel motor plate assembly are replaced.
- If this adjustment is not performed correctly, it may cause the occurance of noise due to a cantact of reel hub to a case in a cassette tape, or damage to the tape due to the incorrect tape running.
- In the following adjustment, it is described under the condition that a reel table is already removed from a reel motor shaft.

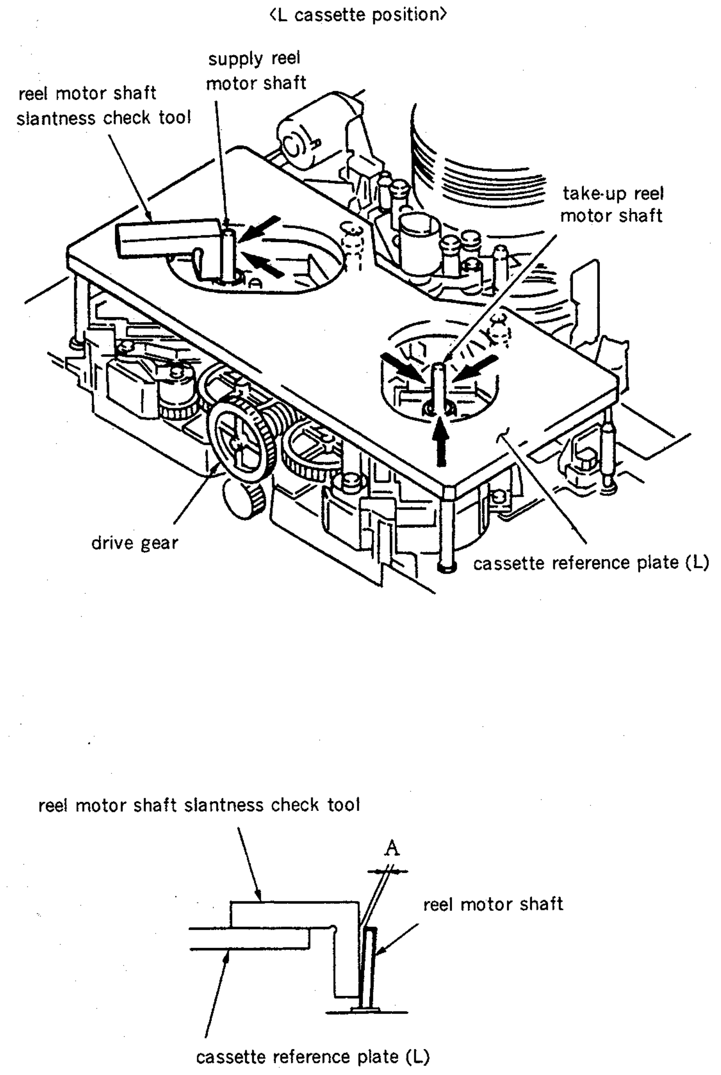
Tools

Cassette reference plate (L): J-6320-880-A
Reel motor shaft slantness check tool
: J-6320-870-A
Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
Wire clearance gauge : J-6152-450-A

Check

1. Make sure that the unit is in unthreading end mode.
2. Clean the surfaces of the cassette reference plate (L) and reel motor shaft slantness check tool with a cleaning piece moistened with cleaning fluid.
3. Rotate a drive gear by fingers so that a reel table is placed to the L cassette position.
4. Place the cassette reference plate (L) on four cassette pillars.
5. Move the reel motor shaft slantness check tool from three directions of arrows towards supply reel motor shaft or take-up reel motor shaft, and make sure that the clearance between the reel motor shaft and slantness check tool satisfies the specification 1 using the wire clearance gauge.

Specification 1 : Upper or lower clearance between the reel motor shaft and slantness check tool is 0.03 mm or less.


⟨L cassette position⟩
supply reel motor shaft
reel motor shaft slantness check tool
take-up reel motor shaft
drive gear
cassette reference plate (L)
reel motor shaft slantness check tool
A
reel motor shaft
cassette reference plate (L)

Spec.1 : (L cassette position)
A≦0.03 mm

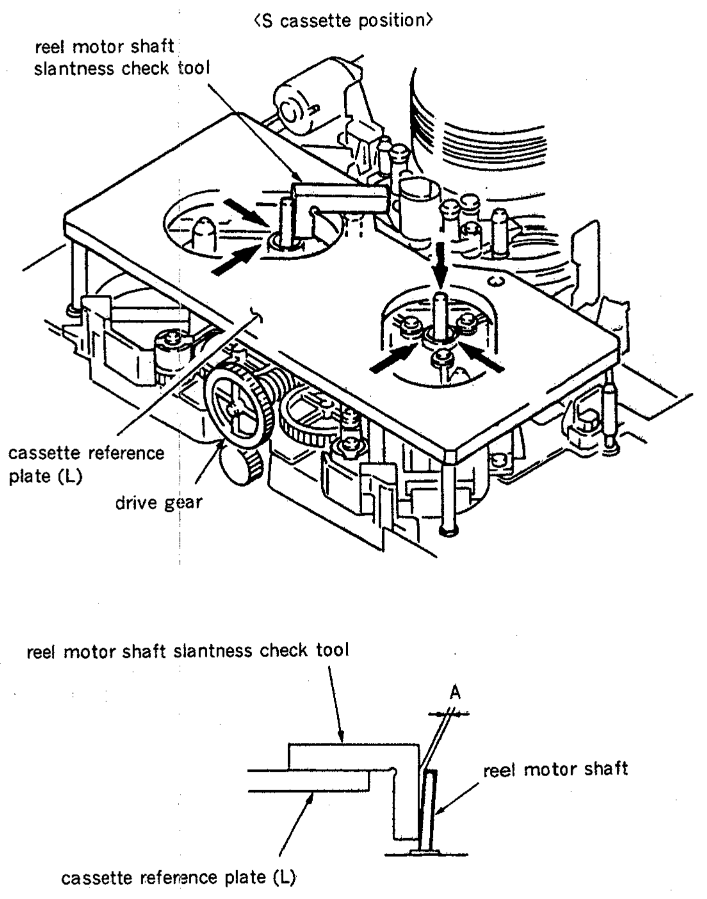
6. Rotate the drive gear by fingers so that the reel table is placed to the S cassette position.
7. Perform step (5), and make sure that the clearance between the reel motor shaft and slantness check tool satisfies the specification 2.

Specification 2 : Upper or lower clearance between the reel motor shaft and slantness check tool is 0.1 mm or less.

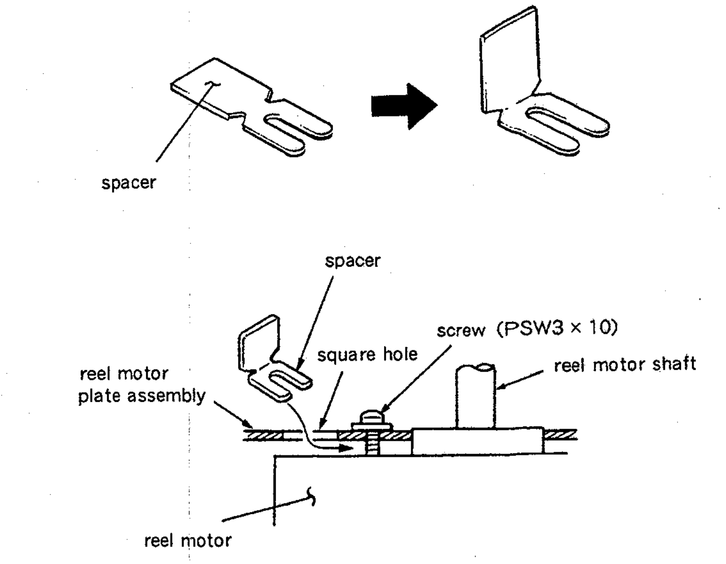
If any specification is not satisfied, perform step (8) and later until the specifications are satisfied at the both positions of the L cassette and S cassette.

Adjustment

8. Bend an adjustment spacer as shown in the figure.
   Adjustment spacer : 3-717-625-01
9. Loosen screws (PSW3×10) that hold the reel motor for one to two turns.
10. Pick the adjustment spacer with tweezers, and insert it between the chassis at the fixing screw and motor through a square hole by a screw on the reel motor plate assembly.
11. Tighten screws which hold the reel motor, and make sure that the specification is satisfied.
    Repeat the steps from (9) to (11) until the specification is satisfied.
12. Perform the following adjustment after the adjustment:
    Reel table heigh adjustment (Refer to Section 4-10-2.)


⟨S cassette position⟩
reel motor shaft slantness check tool
cassette reference plate (L)
drive gear
reel motor shaft slantness check tool
A
reel motor shaft
cassette reference plate (L)

Spec.2 : (S cassette position)
A≦0.1 mm


spacer
spacer
square hole
screw (PSW3 × 10)
reel motor shaft
reel motor plate assembly
reel motor

4-12-2. Reel Motor Operation Check

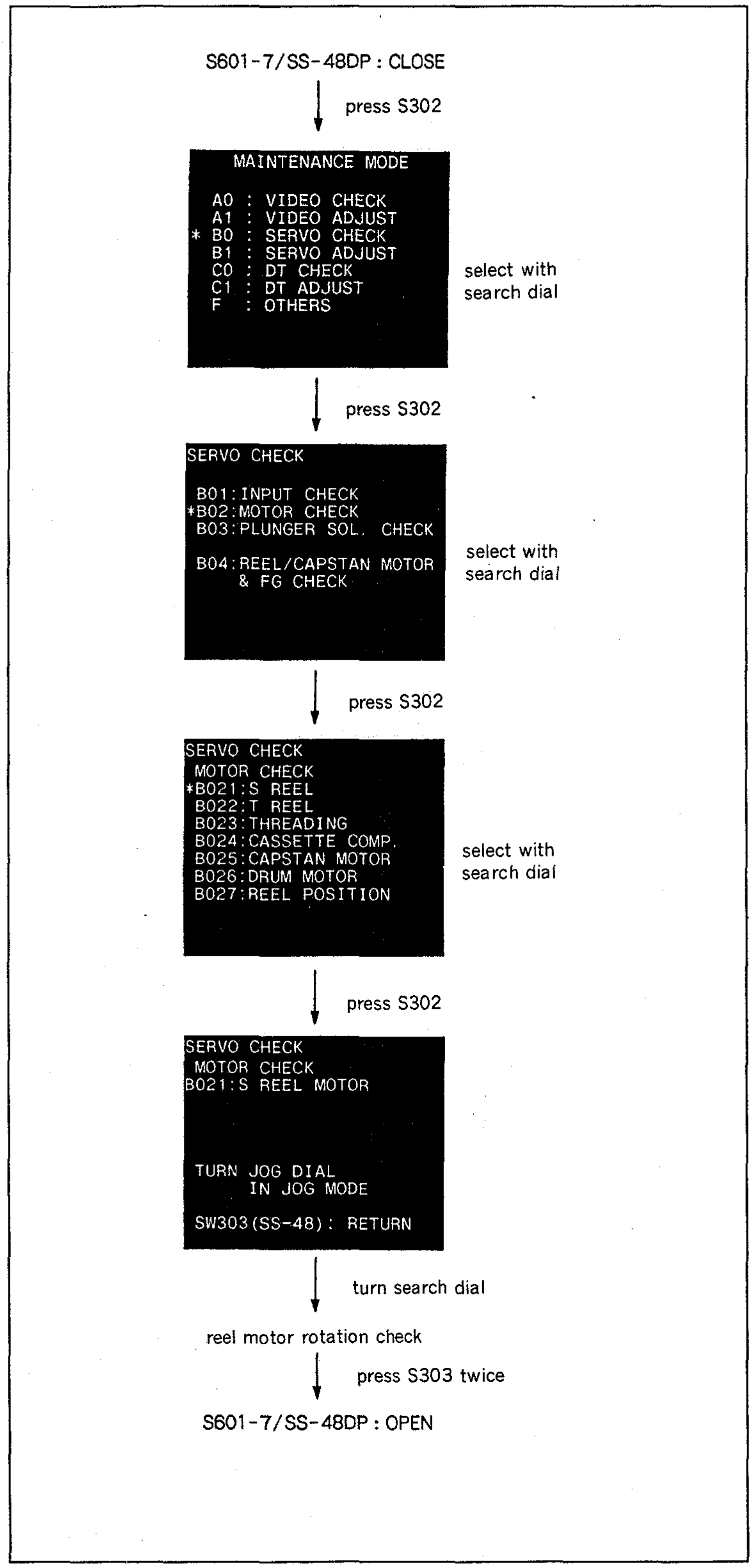
- Be sure to perform the reel motor operation check when a reel motor is replaced.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

1. Put Bit7 of S601 on SS-48DP board in CLOSE state.
2. Turn the POWER to ON. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "BO : SERVO CHECK" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVO CHECK" mode.
5. Move * mark to "BO2 : MOTOR CHECK" which is displaying on the monitor screen with the search dial.
6. Press S302 on SS-48DP board to select "MOTOR CHECK" menu.
7. Move * mark to "BO21: S REEL" or "BO22: T REEL" which is displaying on the monitor screen with the search dial.
8. Press S302 on SS-48DP board and to execute "BO21 : S REEL" or "BO22 : T REEL" sub-menu.
9. The message "TURN JOG DIAL IN JOG MODE" will appear on the monitor screen.
   When rotating the search dial at jog mode, make sure that the reel brake is released, and the reel table rotates in the same direction with the search dial.
   If the reel table does not rotate correctly, check the reel motor driver circuit (on DR-118B board).
   After confirming the correct reel table rotation, press S303 twice on SS-48DP board to return to the mode screen.
10. After confirmation, turn the POWER to OFF, and put Bit7 of S601 on SS-48DP board in OPEN state.


S601-7/SS-48DP : CLOSE
press S302
MAINTENANCE MODE
A0 : VIDEO CHECK
A1 : VIDEO ADJUST
* B0 : SERVO CHECK
B1 : SERVO ADJUST
C0 : DT CHECK
C1 : DT ADJUST
F : OTHERS
select with search dial
press S302
SERVO CHECK
B01:INPUT CHECK
*B02:MOTOR CHECK
B03:PLUNGER SOL. CHECK
B04:REEL/CAPSTAN MOTOR & FG CHECK
select with search dial
press S302
SERVO CHECK
MOTOR CHECK
*B021:S REEL
B022:T REEL
B023:THREADING
B024:CASSETTE COMP.
B025:CAPSTAN MOTOR
B026:DRUM MOTOR
B027:REEL POSITION
select with search dial
press S302
SERVO CHECK
MOTOR CHECK
B021:S REEL MOTOR
TURN JOG DIAL
IN JOG MODE
SW303(SS-48): RETURN
turn search dial
reel motor rotation check
press S303 twice
S601-7/SS-48DP : OPEN

4-12-3. Reel FG Duty Adjustment

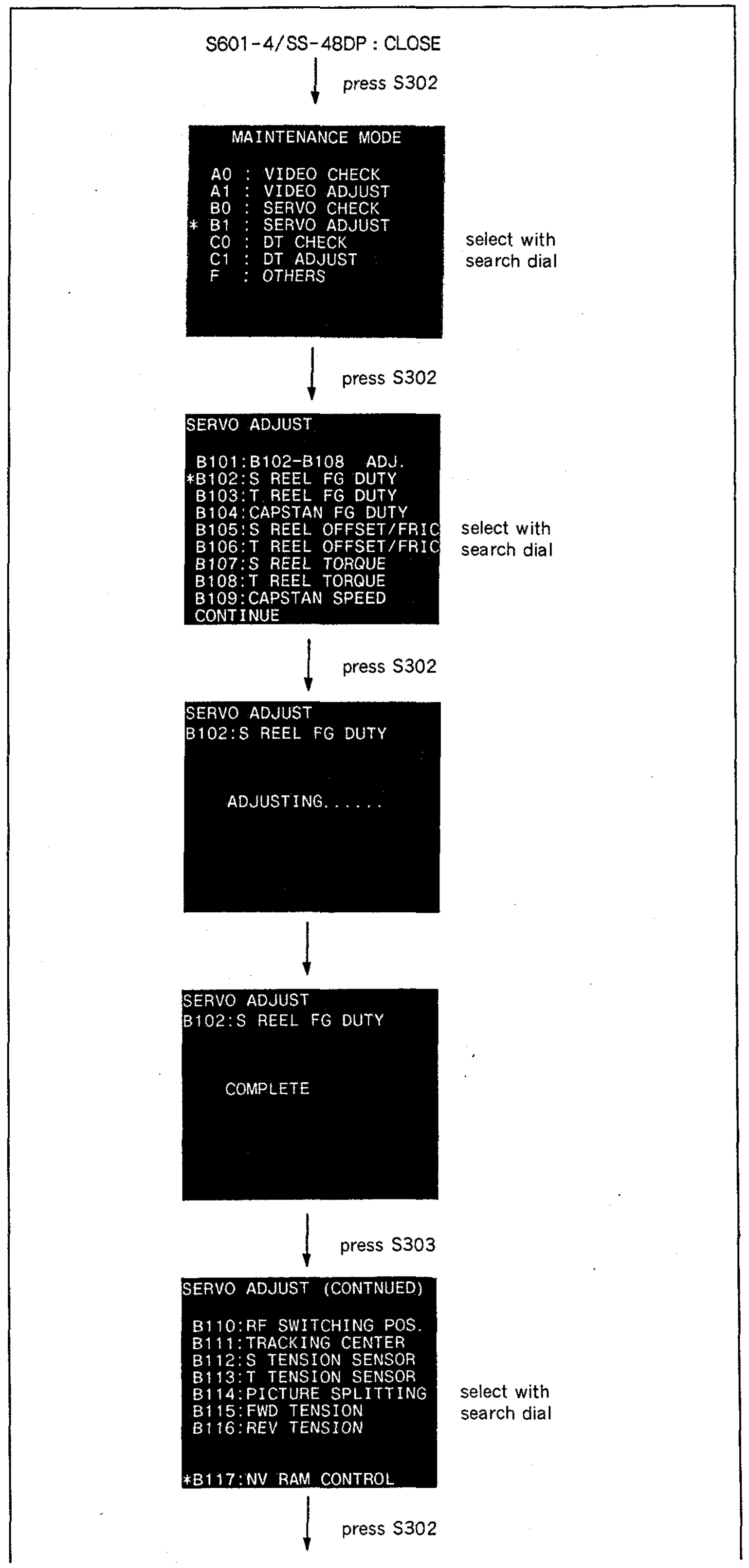
- Be sure to perform the reel FG duty adjustment when a supply or take-up reel motor is replaced.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

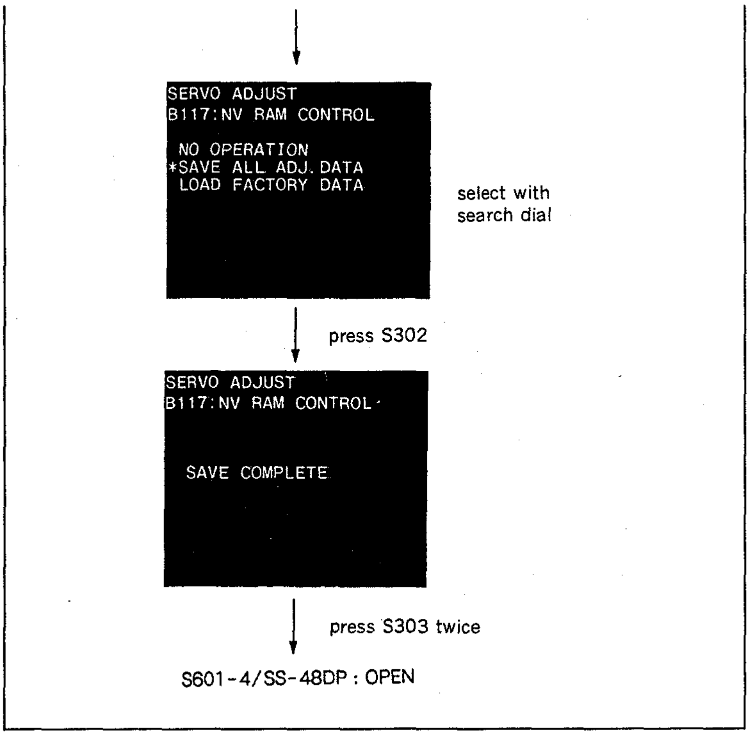
1. Make sure that the unit is in EJECT mode. (The automatic adjustment dose not accept the mode other than EJECT.)
2. Put Bit4 of S601 on SS-48DP board in CLOSE state. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "B1: SERVO ADJUST" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVOADJUST" mode.
5. Move * mark to the following menu which is displaying on the monitor screen with the search dial.
   When a S reel motor is replaced, move * mark to "B102 : S REEL FG DUTY."
   When a T reel motor is replaced, move * mark to "B103 : T REEL FG DUTY."
6. Press S302 on SS-48DP board to execute "S REEL FG DUDY" or "T REEL FG DUTY" menu.
7. Confirm that the message "COMPLETE" is displayed on the monitor screen.
   When "COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.
8. Move * mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.


S601-4/SS-48DP : CLOSE
press S302
MAINTENANCE MODE
A0 : VIDEO CHECK
A1 : VIDEO ADJUST
B0 : SERVO CHECK
* B1 : SERVO ADJUST
C0 : DT CHECK
C1 : DT ADJUST
F : OTHERS
select with search dial
press S302
SERVO ADJUST
B101:B102-B108 ADJ.
*B102:S REEL FG DUTY
B103:T REEL FG DUTY
B104:CAPSTAN FG DUTY
B105:S REEL OFFSET/FRIC
B106:T REEL OFFSET/FRIC
B107:S REEL TORQUE
B108:T REEL TORQUE
B109:CAPSTAN SPEED
CONTINUE
select with search dial
press S302
SERVO ADJUST
B102:S REEL FG DUTY
ADJUSTING......
SERVO ADJUST
B102:S REEL FG DUTY
COMPLETE
press S303
SERVO ADJUST (CONTNUED)
B110:RF SWITCHING POS.
B111:TRACKING CENTER
B112:S TENSION SENSOR
B113:T TENSION SENSOR
B114:PICTURE SPLITTING
B115:FWD TENSION
B116:REV TENSION
*B117:NV RAM CONTROL
select with search dial
press S302

9. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
10. Move * mark to "SAVE ALL ADJ. DATA" with the search dial.
11. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
12. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.

Note 1: When "INCOMPLETE" appears on the monitor screen in step (7), press S303 on SS-48DP board to return to the menu screen.
Check the reel rotation detector, reel FG amplifier circuit and reel motor drive circuit (on DR-118B board and SS-48DP board).

Note 2: When the "SERVO ADJUST" mode is completed, turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ. DATA
 LOAD FACTORY DATA
```

select with search dial

press S302

```
SERVO ADJUST
B117:NV RAM CONTROL

  SAVE COMPLETE
```

press S303 twice

S601-4/SS-48DP : OPEN

4-12-4. S Reel Offset/Friction Adjustment

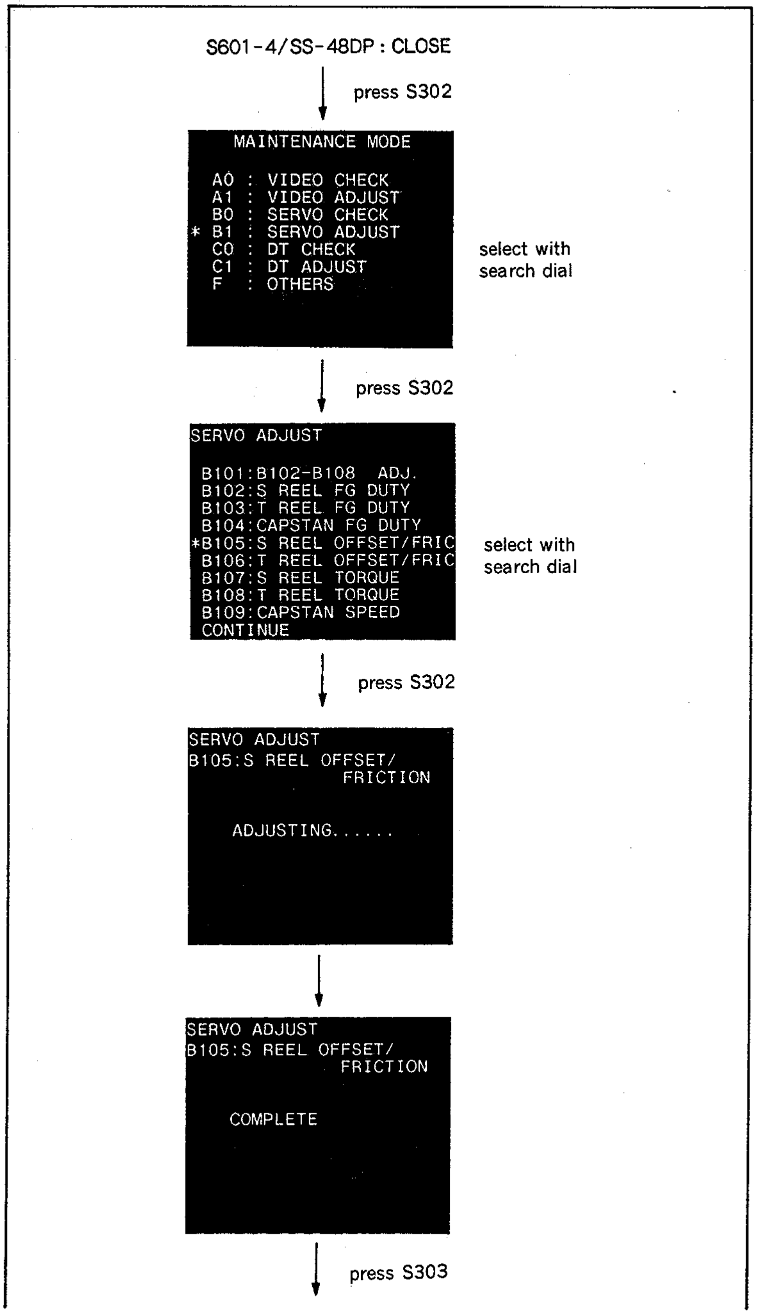
- Be sure to perform the S reel offset/friction adjustment when a supply reel motor is replaced.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

1. Make sure that the unit is in EJECT mode. (The automatic adjustment dose not accept the mode other than EJECT.)
2. Put Bit4 of S601 on SS-48DP board in CLOSE state. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "B1: SERVO ADJUST" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVOADJUST" mode.
5. Move * mark to "B105: S REEL OFFSET/FRIC" which is displaying on monitor screen with the search dial.
6. Press S302 on SS-48DP board to execute "S REEL OFFSET/FRIC".
7. Confirm that the message "COMPLETE" is displayed on the monitor screen.
   When "COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.



S601-4/SS-48DP : CLOSE

press S302

```
       MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
  B0 : SERVO CHECK
* B1 : SERVO ADJUST
  C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

select with search dial

press S302

```
SERVO ADJUST

 B101:B102-B108  ADJ.
 B102:S REEL FG DUTY
 B103:T REEL FG DUTY
 B104:CAPSTAN FG DUTY
*B105:S REEL OFFSET/FRIC
 B106:T REEL OFFSET/FRIC
 B107:S REEL TORQUE
 B108:T REEL TORQUE
 B109:CAPSTAN SPEED
 CONTINUE
```

select with search dial

press S302

```
SERVO ADJUST
B105:S REEL OFFSET/
             FRICTION

     ADJUSTING......
```

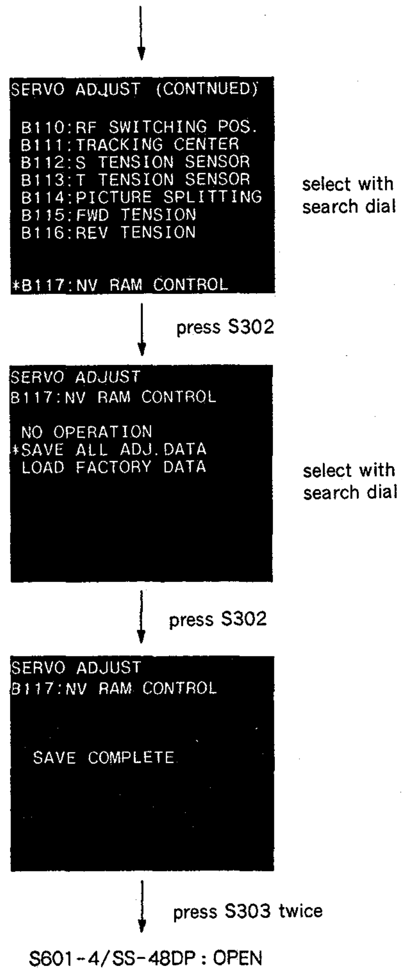
```
SERVO ADJUST
B105:S REEL OFFSET/
             FRICTION

     COMPLETE
```

press S303

8. Move ∗ mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.
9. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
10. Move ∗ mark to "SAVE ALL ADJ. DATA" with the search dial.
11. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
12. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.

Note 1: When "INCOMPLETE" appears on the monitor screen in step (7), press S303 on SS-48DP board to return to the menu screen.
Check the reel motor, reel FG duty adjustment and reel motor drive circuit (on DR-118B board).

Note 2: When the "SERVO ADJUST" mode is completed, turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION

*B117:NV RAM CONTROL
```

```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

```
SERVO ADJUST
B117:NV RAM CONTROL


  SAVE COMPLETE
```

4-12-5. S Reel Torque Adjustment

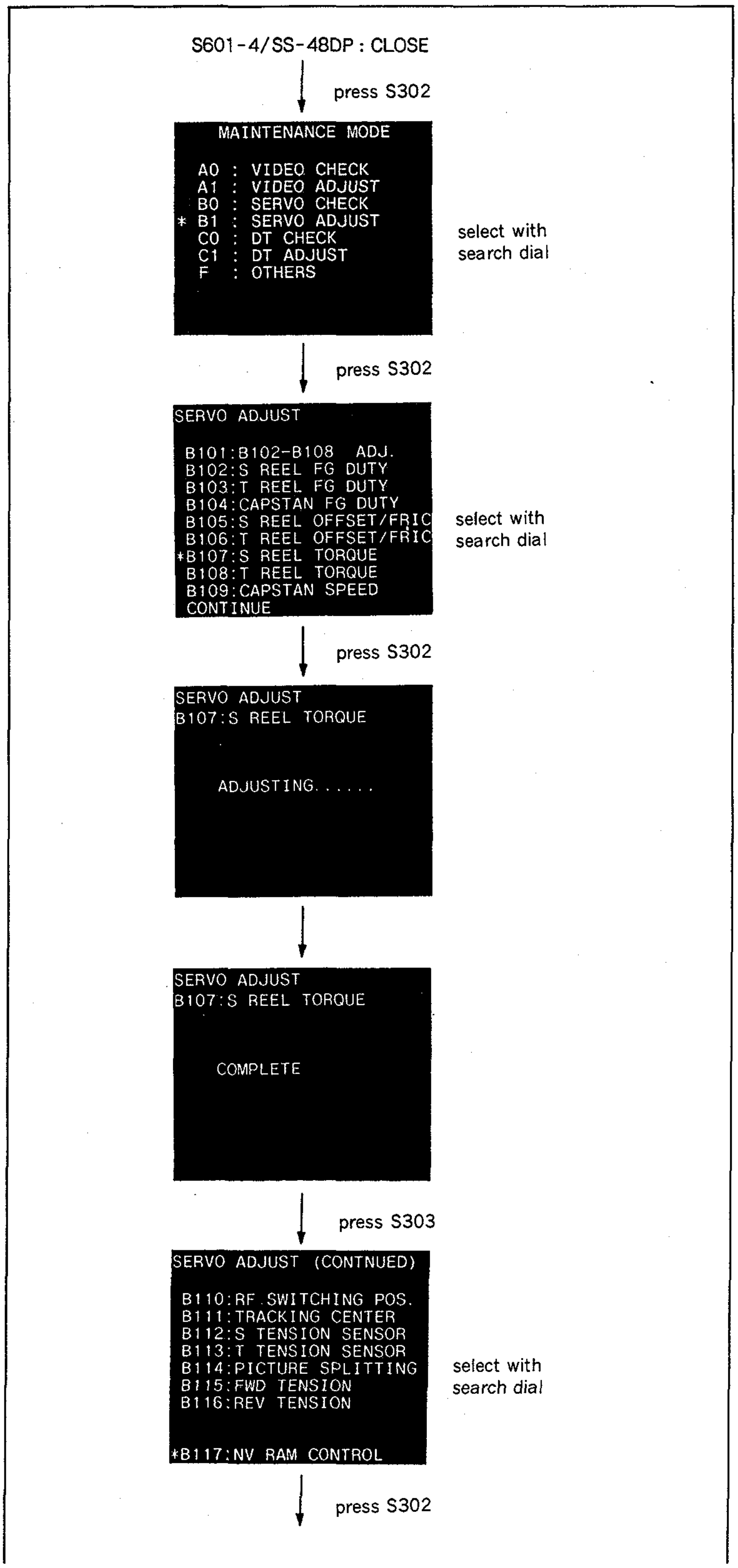
- Be sure to perform the S reel torque adjustment when a supply reel motor is replaced.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

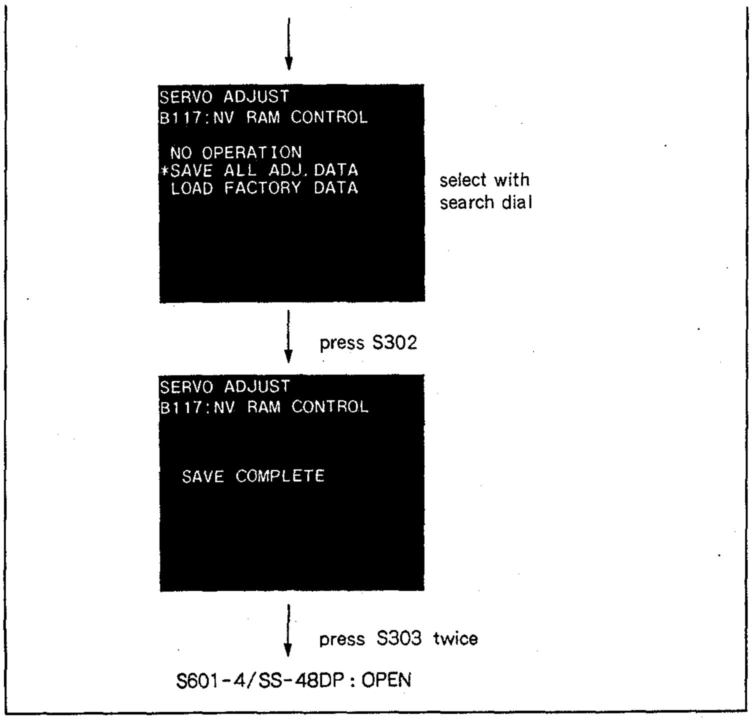
1. Make sure that the unit is in EJECT mode. (The automatic adjustment dose not accept the mode other than EJECT.)
2. Put Bit4 of S601 on SS-48DP board in CLOSE state. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "B1: SERVO ADJUST" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.
5. Move * mark to "B107: S REEL TORQUE" which is displaying on monitor screen with the search dial.
6. Press S302 on SS-48DP board to execute "SREEL TORQUE".
7. Confirm that the message "COMPLETE" is displayed on the monitor screen.
   When "COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.
8. Move * mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.
9. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.


S601-4/SS-48DP : CLOSE
press S302
MAINTENANCE MODE
A0 : VIDEO CHECK
A1 : VIDEO ADJUST
B0 : SERVO CHECK
* B1 : SERVO ADJUST
C0 : DT CHECK
C1 : DT ADJUST
F : OTHERS
select with search dial
press S302
SERVO ADJUST
B101:B102-B108 ADJ.
B102:S REEL FG DUTY
B103:T REEL FG DUTY
B104:CAPSTAN FG DUTY
B105:S REEL OFFSET/FRIC
B106:T REEL OFFSET/FRIC
*B107:S REEL TORQUE
B108:T REEL TORQUE
B109:CAPSTAN SPEED
CONTINUE
select with search dial
press S302
SERVO ADJUST
B107:S REEL TORQUE
ADJUSTING. . . . .
SERVO ADJUST
B107:S REEL TORQUE
COMPLETE
press S303
SERVO ADJUST (CONTNUED)
B110:RF SWITCHING POS.
B111:TRACKING CENTER
B112:S TENSION SENSOR
B113:T TENSION SENSOR
B114:PICTURE SPLITTING
B115:FWD TENSION
B116:REV TENSION
*B117:NV RAM CONTROL
select with search dial
press S302

10. Move ＊ mark to "SAVE ALL ADJ. DATA" with the search dial.
11. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
12. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.

Note 1: When "INCOMPLETE" appears on the monitor screen in step (7), press S303 on SS-48DP board to return to the menu screen. Perform reel FG duty adjustment. Check the reel motor drive circuit (on DR-118B board).

Note 2: When the "SERVO ADJUST" mode is completed, turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ. DATA
 LOAD FACTORY DATA
```

```
SERVO ADJUST
B117:NV RAM CONTROL

  SAVE COMPLETE
```

S601-4/SS-48DP : OPEN

4-12-6. T Reel Offset/Friction Adjustment

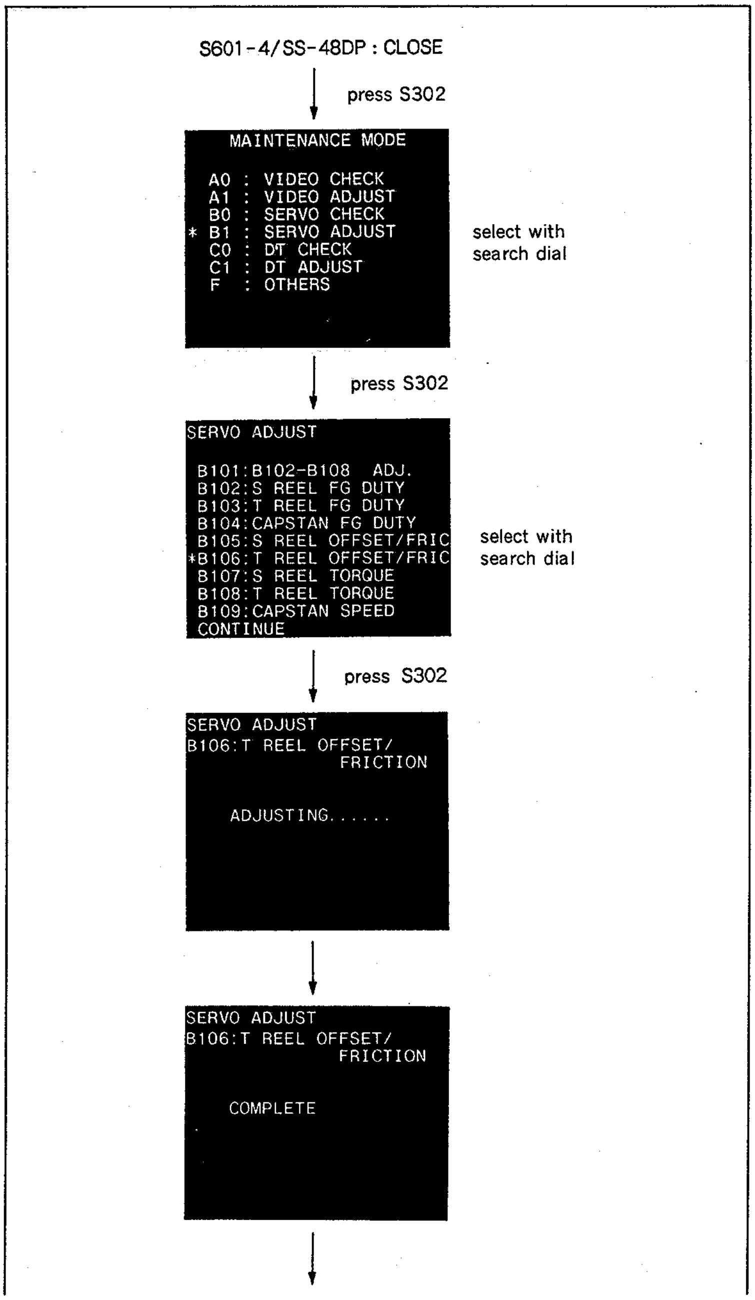
- Be sure to perform the T reel offset/friction adjustment when a take-up reel motor is replaced.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

1. Make sure that the unit is in EJECT mode. (The automatic adjustment dose not accept the mode other than EJECT.)
2. Put Bit4 of S601 on SS-48DP board in CLOSE state. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "B1: SERVO ADJUST" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVOADJUST" mode.
5. Move * mark to "B106: T REEL OFFSET/FRIC" which is displaying on monitor screen with the search dial.
6. Press S302 on SS-48DP board to execute "TREEL OFFSET/FRIC".
7. Confirm that the message "COMPLETE" is displayed on the monitor screen.
   When "COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.
8. Move * mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.
9. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
10. Move * mark to "SAVE ALL ADJ. DATA" with the search dial.
11. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
12. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.



```
MAINTENANCE MODE

 A0 : VIDEO CHECK
 A1 : VIDEO ADJUST
 B0 : SERVO CHECK
*B1 : SERVO ADJUST
 C0 : DT CHECK
 C1 : DT ADJUST
 F  : OTHERS
```

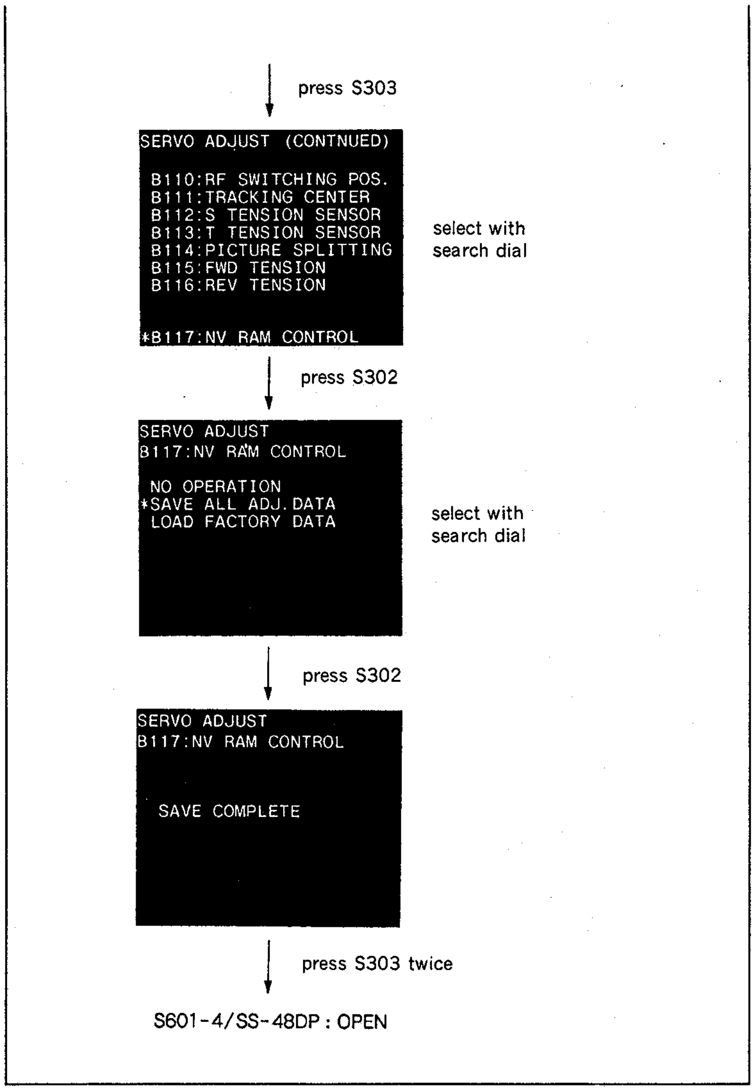
```
SERVO ADJUST

 B101:B102-B108  ADJ.
 B102:S REEL FG DUTY
 B103:T REEL FG DUTY
 B104:CAPSTAN FG DUTY
 B105:S REEL OFFSET/FRIC
*B106:T REEL OFFSET/FRIC
 B107:S REEL TORQUE
 B108:T REEL TORQUE
 B109:CAPSTAN SPEED
 CONTINUE
```

```
SERVO ADJUST
B106:T REEL OFFSET/
             FRICTION

    ADJUSTING......
```

```
SERVO ADJUST
B106:T REEL OFFSET/
             FRICTION

    COMPLETE
```

Note 1: When "INCOMPLETE" appears on the monitor screen in step (7), press S303 on SS-48DP board to return to the menu screen.
Check the reel motor, reel FG duty adjustment and reel motor drive circuit (on DR-118B board).

Note 2: When the "SERVO ADJUST" mode is completed, turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



press S303

```
SERVO ADJUST  (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION


*B117:NV RAM CONTROL
```

select with search dial

press S302

```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

select with search dial

press S302

```
SERVO ADJUST
B117:NV RAM CONTROL


  SAVE COMPLETE
```

press S303 twice

S601-4/SS-48DP : OPEN

4-12-7. T Reel Torque Adjustment

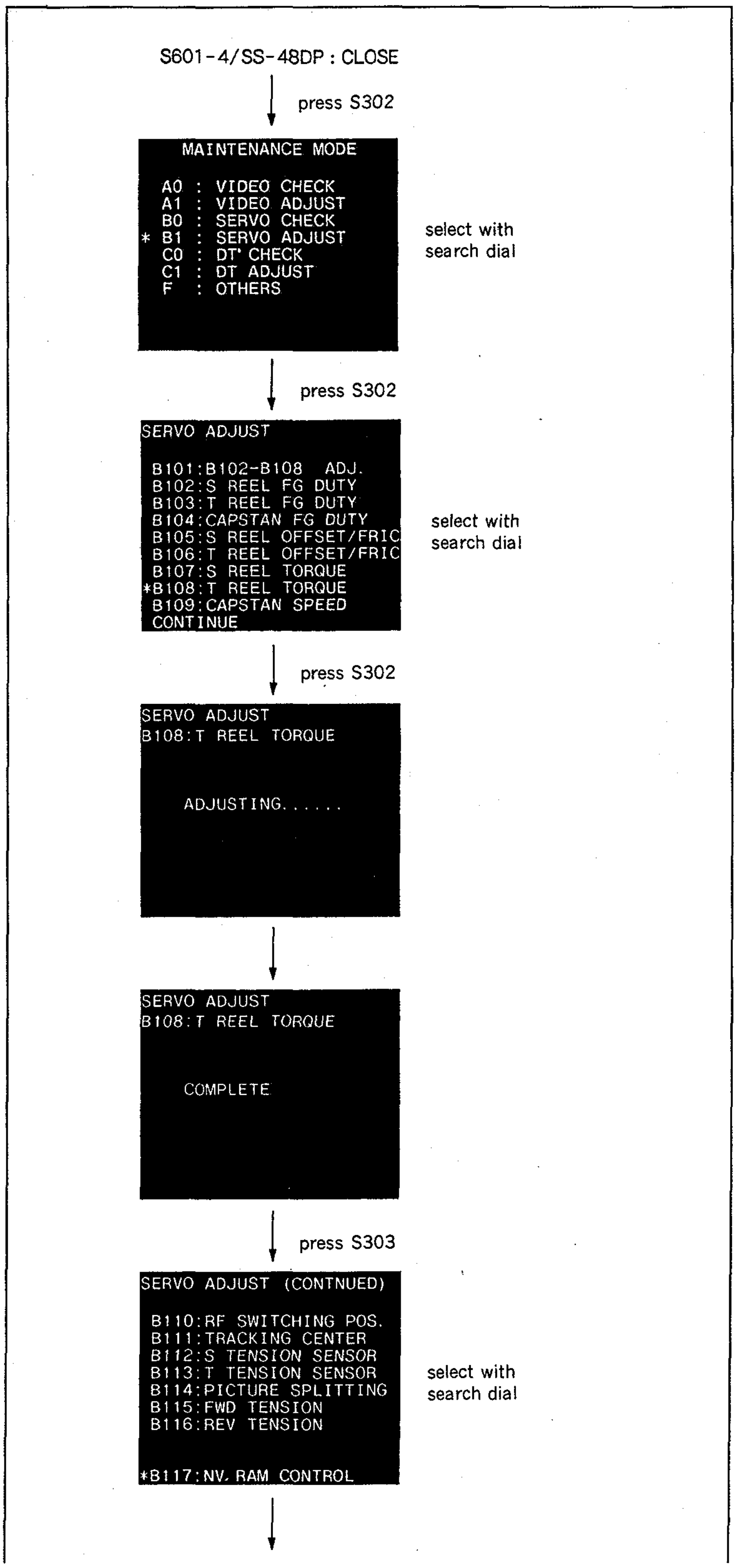
- Be sure to perform the T reel torque adjustment when a take-up reel motor is replaced.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

1. Make sure that the unit is in EJECT mode. (The automatic adjustment dose not accept the mode other than EJECT.)
2. Put Bit4 of S601 on SS-48DP board in CLOSE state. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "B1: SERVO ADJUST" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.
5. Move * mark to "B108: T REEL TORQUE" which is displaying on monitor screen with the search dial.
6. Press S302 on SS-48DP board to execute "T REEL TORQUE".
7. Confirm that the message "COMPLETE" is displayed on the monitor screen.
   When "COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.
8. Move * mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.



```
MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
  B0 : SERVO CHECK
* B1 : SERVO ADJUST
  C0 : DT' CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

```
SERVO ADJUST

 B101:B102-B108  ADJ.
 B102:S REEL FG DUTY
 B103:T REEL FG DUTY
 B104:CAPSTAN FG DUTY
 B105:S REEL OFFSET/FRIC
 B106:T REEL OFFSET/FRIC
 B107:S REEL TORQUE
*B108:T REEL TORQUE
 B109:CAPSTAN SPEED
 CONTINUE
```

```
SERVO ADJUST
B108:T REEL TORQUE


    ADJUSTING......
```

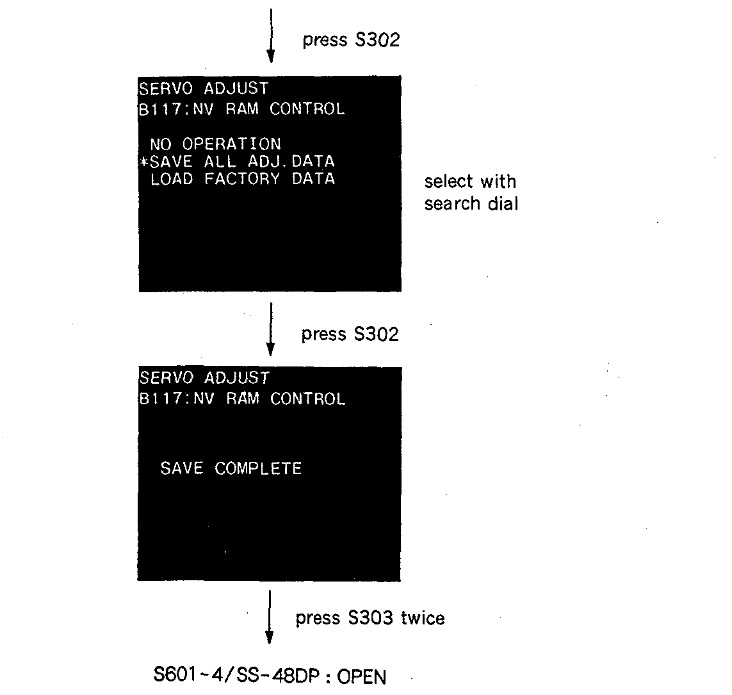
```
SERVO ADJUST
B108:T REEL TORQUE


    COMPLETE
```

```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION


*B117:NV. RAM CONTROL
```

9. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
10. Move * mark to "SAVE ALL ADJ. DATA" with the search dial.
11. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
12. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.

Note 1: When "INCOMPLETE" appears on the monitor screen in step (7), press S303 on SS-48DP board to return to the menu screen. Perform reel FG duty adjustment. Check the reel motor drive circuit (on DR-118B board).

Note 2: When the "SERVO ADJUST" mode is completed, turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

```
SERVO ADJUST
B117:NV RAM CONTROL


  SAVE COMPLETE
```

4-13. REEL POSITION MOTOR REPLACEMENT

Tools

L shaped wrench (across flat has 0.89 ㎜)
: 7-700-736-06
Wire clearance gauge : J-6152-450-A

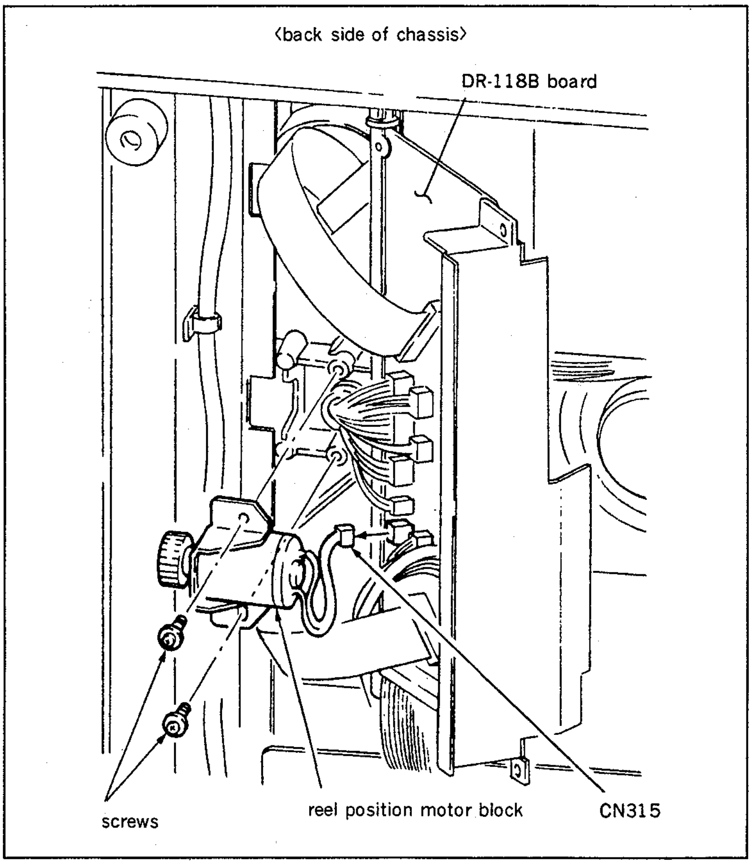
Replacement flow chart

Replacement of reel position motor

Confirmation of reel position motor operation

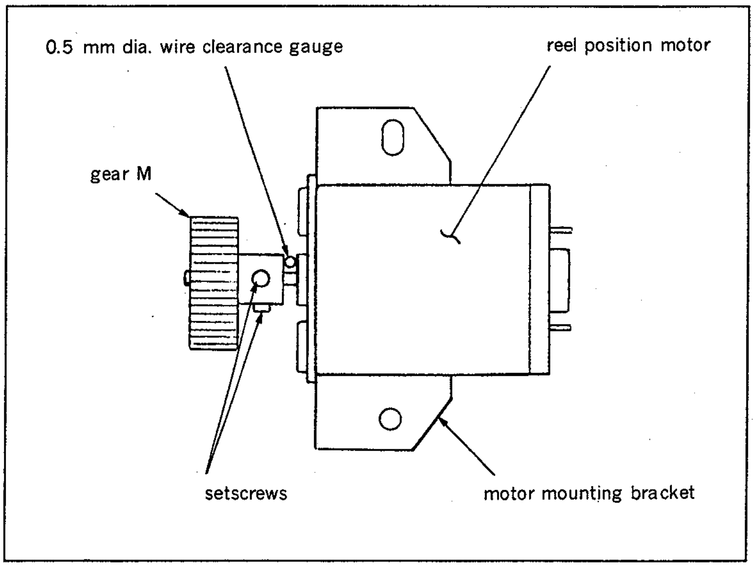
Removal

1. Open DR-118B board.
2. Disconnect a connecter CN315 of the reel position motor from DR-118B board.
3. Remove two screws (PWH3×8) shown in the figure, and remove a reel position motor block.
4. Loosen two setscrews of a gear M, and remove the gear M from the reel position motor shaft.
5. Remove two screws (B3×4), and remove a reel position motor.
6. Unsloder two lead wires of the reel position motor.



Installation

7. Solder two lead wires unsoldered in step (6) to a new reel position motor.
   Solder a yellow leed wire to + terminal
8. Install the new reel position motor to a motor mounting bracket as the yellow lead wire faces in the direction of a S reel table.
9. Insert the gear M to the reel position motor shaft.
10. Put the wire clearance gauge (0.5 ㎜) between the gear M and boss of the motor, and tighen two setscrews while pressing the gear M towards the motor side.
11. Install the reel position motor block to the chassis with two screws (PWH3×8).
12. Connect the reel position motor connector to CN315 on DR-118B board.



Adjustment after replacement

13. Perform confirmation of reel position motor operation. (Refer to Section 4-13-1.)

4-13-1. Reel Position Motor Operation Check

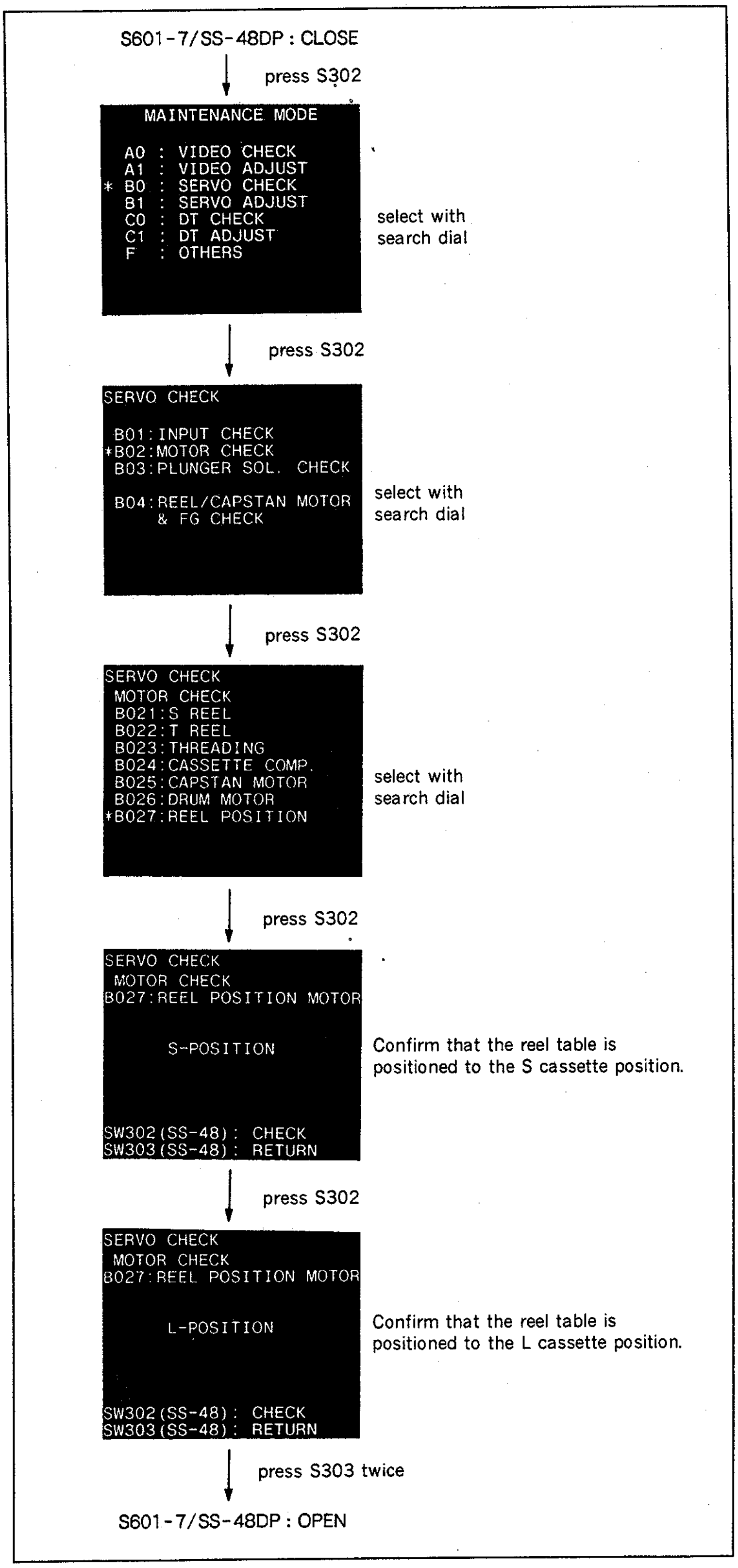
- Be sure to perform the reel position motor operation check when a reel position motor is replaced.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

1. Put Bit7 of S601 on SS-48DP board in CLOSE state.
2. Turn the POWER to ON. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "BO: SERVO CHECK" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVO CHECK" mode.
5. Move * mark to "BO2: MOTOR CHECK" which is displaying on the monitor screen with the search dial.
6. Press S302 on SS-48DP board to select "MOTOR CHECK" menu.
7. Move * mark to "BO27: REEL POSITION" which is displaying on the monitor screen with the search dial.
8. Press S302 on SS-48DP board to execute "REEL POSITION" sub-menu.
9. Press S302 on SS-48DP board, make sure that a reel table moves.
   When the reel table is positioned to the S cassette position, confirm that the message "S-POSITION" is displayed on the monitor screen.
   When the reel table is positioned to the L cassette position, confirm that the message "L-POSITION" is displayed on the monitor screen.
   If the message does not apper on the monitor screen, check the reel position motor driver circuit (on DR-118B board) and reel position switch operates normally.
10. Press S303 twice on SS-48DP board to return to the mode screen.
11. After confirmation, turn the POWER to OFF, and put Bit7 of S601 on SS-48DP board in OPEN state.



S601-7/SS-48DP : CLOSE

press S302

```
MAINTENANCE MODE

 A0 : VIDEO CHECK
 A1 : VIDEO ADJUST
* B0 : SERVO CHECK
 B1 : SERVO ADJUST
 C0 : DT CHECK
 C1 : DT ADJUST
 F  : OTHERS
```

select with search dial

press S302

```
SERVO CHECK

 B01:INPUT CHECK
*B02:MOTOR CHECK
 B03:PLUNGER SOL. CHECK

 B04:REEL/CAPSTAN MOTOR
       & FG CHECK
```

select with search dial

press S302

```
SERVO CHECK
 MOTOR CHECK
 B021:S REEL
 B022:T REEL
 B023:THREADING
 B024:CASSETTE COMP.
 B025:CAPSTAN MOTOR
 B026:DRUM MOTOR
*B027:REEL POSITION
```

select with search dial

press S302

```
SERVO CHECK
 MOTOR CHECK
B027:REEL POSITION MOTOR

      S-POSITION

SW302(SS-48) : CHECK
SW303(SS-48) : RETURN
```

Confirm that the reel table is positioned to the S cassette position.

press S302

```
SERVO CHECK
 MOTOR CHECK
B027:REEL POSITION MOTOR

      L-POSITION

SW302(SS-48) : CHECK
SW303(SS-48) : RETURN
```

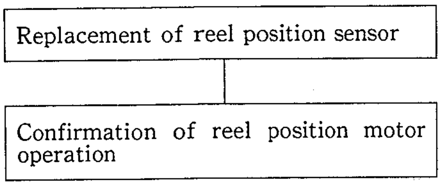
Confirm that the reel table is positioned to the L cassette position.

press S303 twice

S601-7/SS-48DP : OPEN

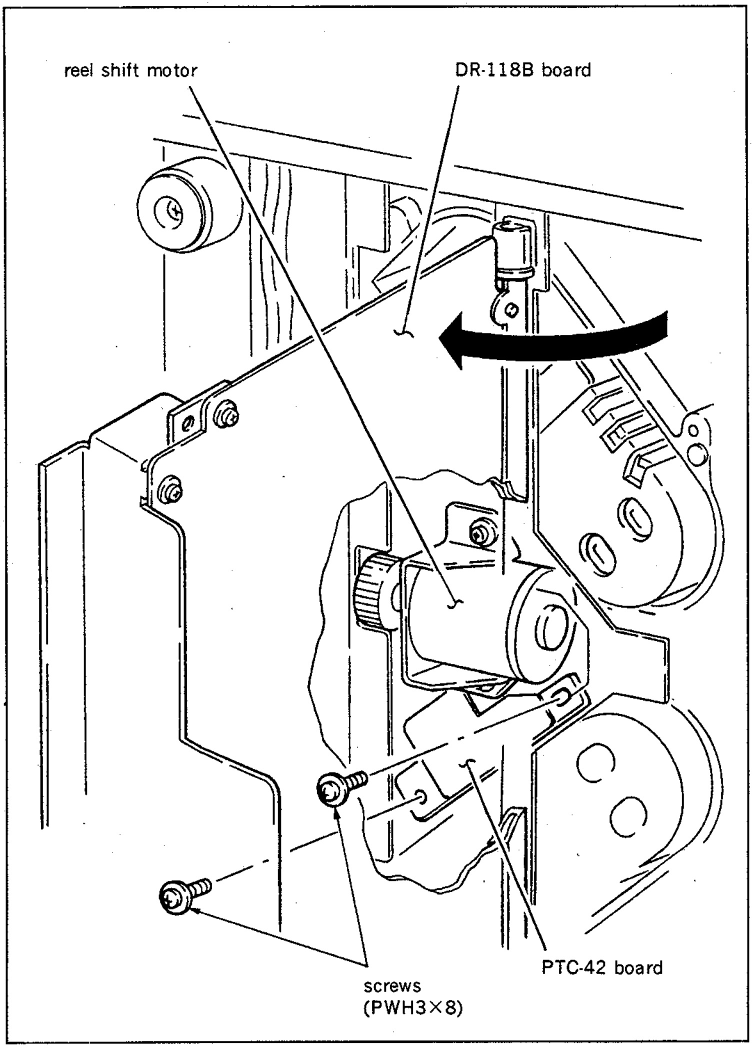
4-14. REEL POSITION SENSOR REPLACEMENT

Replacement flow chart


Replacement of reel position sensor
Confirmation of reel position motor operation

Removal

1. Open DR-118B board.
2. Remove two screws that holds PTC-42 board where a reel position sensors are mounted.
3. Disconnect connector CN924 while lifting PTC-42 board.
4. Uusolder the reel position sensor.


reel shift motor
DR-118B board
screws
(PWH3×8)
PTC-42 board

Installation

5. Mount a new reel position sensor to match a polarity that is silk screened on the PTC-42 board.
6. Connect connector CN924 to PTC-42 board, and install it to the chassis.

Adjustment after replacement

7. Perform reel position motor operation check. (Refer to Section 4-13-1.)

4-15. THREADING MOTOR REPLACEMENT

Tools

L shaped wrench (across flat has 1.27 mm)
: 7-700-736-01
Wire clearance gauge : J-6152-450-A

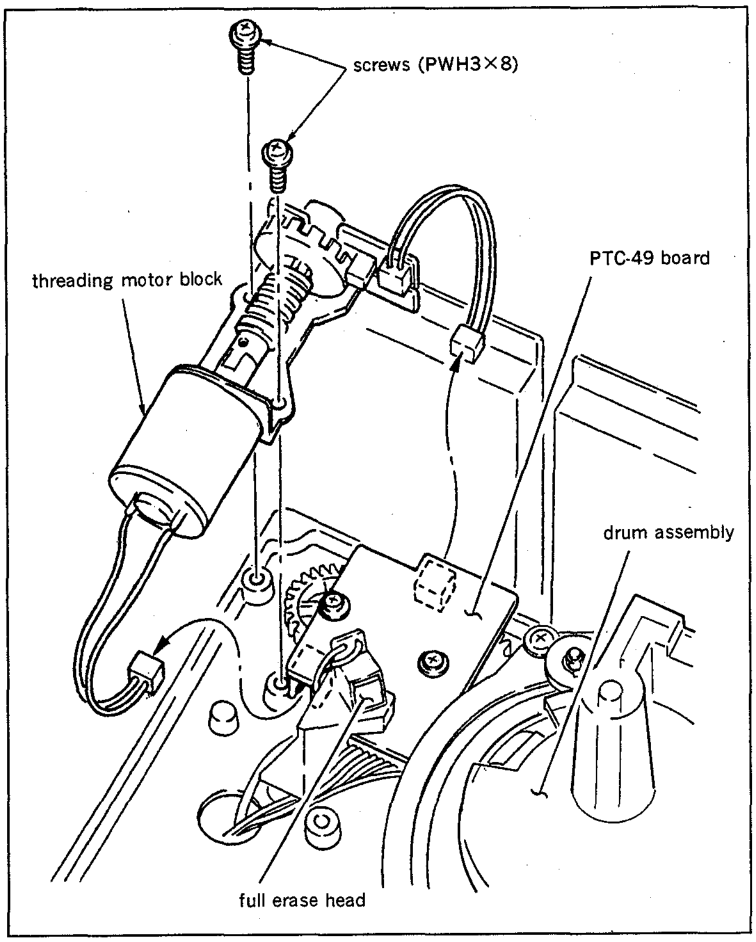
Replacement flow chart

Replacement of threading motor

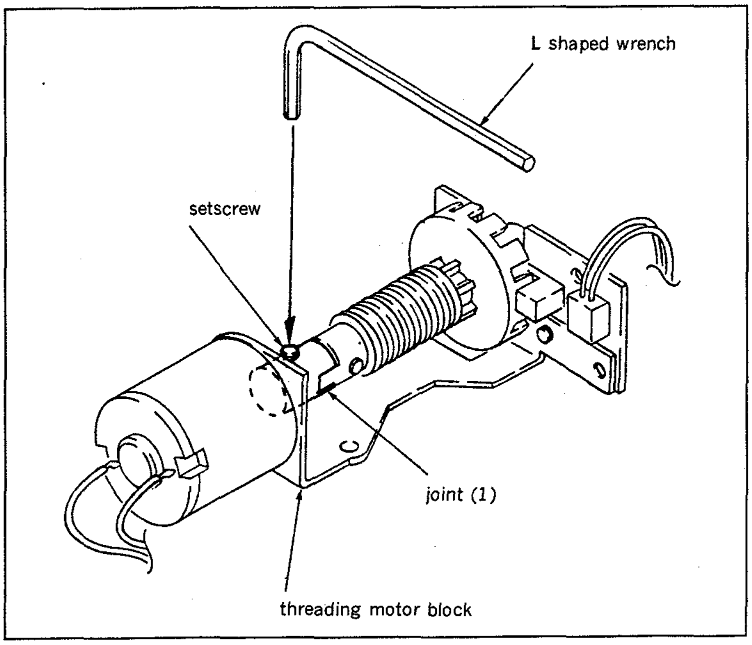
Confirmation of threading motor operation

Removal

1. Disconnect connectors CN903 and CN902 from PTC-49 board.
2. Remove two screws (PWH3×8) shown in the figure, and remove a threading motor block.


screws (PWH3×8)
threading motor block
PTC-49 board
drum assembly
full erase head

3. Loosen a setscrew of a joint (1) with L shaped wrench.
4. Remove two screws (B3×4), and remove a threading motor.
5. Unsolder two lead wires from the threading motor.

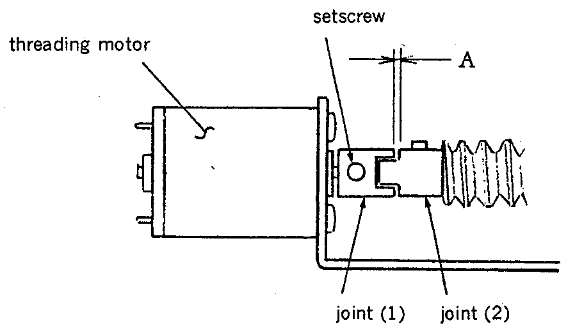

L shaped wrench
setscrew
joint (1)
threading motor block

Installation

6. Solder two lead wires which are unsoldered in step (5) to a new threading motor.

Note :Solder brown lead wire to plus terminal.

7. After a threading motor shaft is pass through a hole of the threading motor bracket, and insert the joint (1) to the motor shaft.
8. Install the threading motor to the threading motor bracket with two screws (B3×4) so that the following two requirements are satisfied:
   - The brown lead wire must face in the direction of the drum when installing to the threading motor bracket.
   - Engage the joint (1) with the joint (2) of the worm assembly.
9. Install the joint (1) to the motor shaft with a setscrew so that the clearance between the joints (1) and (2) satisfies the specification.
10. Make sure that the threading motor rotation detection ring rotates smoothly when it is turned by fingers.
11. Install the threading motor block to chassis with two screws (PWH3×8).
12. Connect the connectors CN903 and CN902 to PTC-49 board.



Spec.: 0.5 mm≦A≦0.8 mm

Adjustment after replacement

13. Perform threading motor operation check. (Refer to Section 4-15-1.)

4-15-1. Threading Motor Operation Check

- Be sure to perform the theading motor operation check when a threading motor is replaced.

Preparation

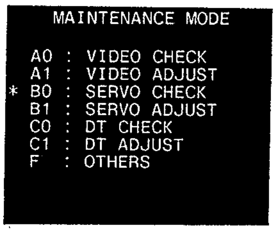
Connect a video monitor with MONITOR connector, and display characters.

Check

1. Put Bit7 of S601 on SS-48DP board in CLOSE state.
2. Turn the POWER to ON. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move ∗ mark to "BO: SERVO CHECK" which is displaying on the monitor screen with the search dial.

S601-7/SS-48DP : CLOSE

press S302

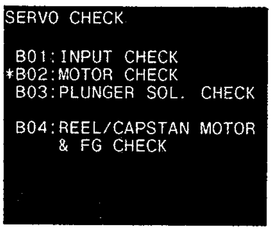


```
      MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
* B0 : SERVO CHECK
  B1 : SERVO ADJUST
  C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

select with search dial

4. Press S302 on SS-48DP board to select "SERVO CHECK" mode.
5. Move ∗ mark to "BO2: MOTOR CHECK" which is displaying on the monitor screen with the search dial.
6. Press S302 on SS-48DP board to select "MOTOR CHECK" menu.
7. Move ∗ mark to "BO23: THREADING" which is displaying on the monitor screen with the search dial.
8. Press S302 on SS-48DP board to execute "THREADING" sub-menu.
9. Message "TURN JOG DIAL IN JOG MODE, FWD : THREAD, REV : UNTH" will appear on the monitor screen.
   Then turn the search dial to the direction of FWD according to the message, make sure that the threading motor rotates in the threading direction, and message on the screen changes into "THREAD END".
10. Turn the search dial to the direction of REV. Make sure that the threading motor rotates in the unthreading direction, and message on the screen changes into "UNTHREAD END".
    If the message does not appear, check the loading motor drive circuit, loading FG amplifier (on DR-118B board) and to make sure that the loading TOP/END switch operates normally.
11. Press S303 twice on SS-48DP board to return to the mode screen.
12. After confirmation, turn the POWER to OFF, and put Bit7 of S601 on SS-48DP board in OPEN state.

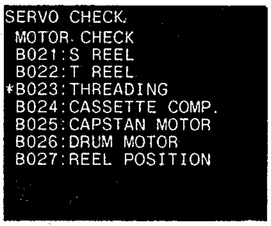
press S302



```
SERVO CHECK

 B01:INPUT CHECK
*B02:MOTOR CHECK
 B03:PLUNGER SOL. CHECK

 B04:REEL/CAPSTAN MOTOR
     & FG CHECK
```

select with search dial

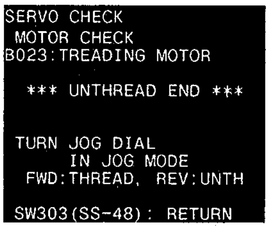
press S302



```
SERVO CHECK
 MOTOR CHECK
 B021:S REEL
 B022:T REEL
*B023:THREADING
 B024:CASSETTE COMP.
 B025:CAPSTAN MOTOR
 B026:DRUM MOTOR
 B027:REEL POSITION
```

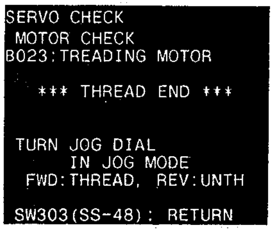
select with search dial

press S302



```
SERVO CHECK
 MOTOR CHECK
B023:TREADING MOTOR

  *** UNTHREAD END ***


 TURN JOG DIAL
      IN JOG MODE
  FWD:THREAD, REV:UNTH

 SW303(SS-48): RETURN
```

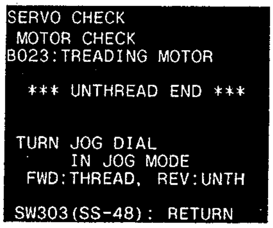
turn search dial to the direction of FWD



```
SERVO CHECK
 MOTOR CHECK
B023:TREADING MOTOR

   *** THREAD END ***


 TURN JOG DIAL
      IN JOG MODE
  FWD:THREAD, REV:UNTH

 SW303(SS-48): RETURN
```

Make sure that the unit is in the threading end state.

turn search dial to the direction of REV



```
SERVO CHECK
 MOTOR CHECK
B023:TREADING MOTOR

  *** UNTHREAD END ***


 TURN JOG DIAL
      IN JOG MODE
  FWD:THREAD, REV:UNTH

 SW303(SS-48): RETURN
```

Make sure that the unit is in the unthreading end state.

press S303 twice

S601-7/SS-48DP : OPEN

4-16. S SLIDER ASSEMBLY REPLACEMENT

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Molyton grease	: 7-662-001-41

Replacement flow chart

Replacement of S slider assembly

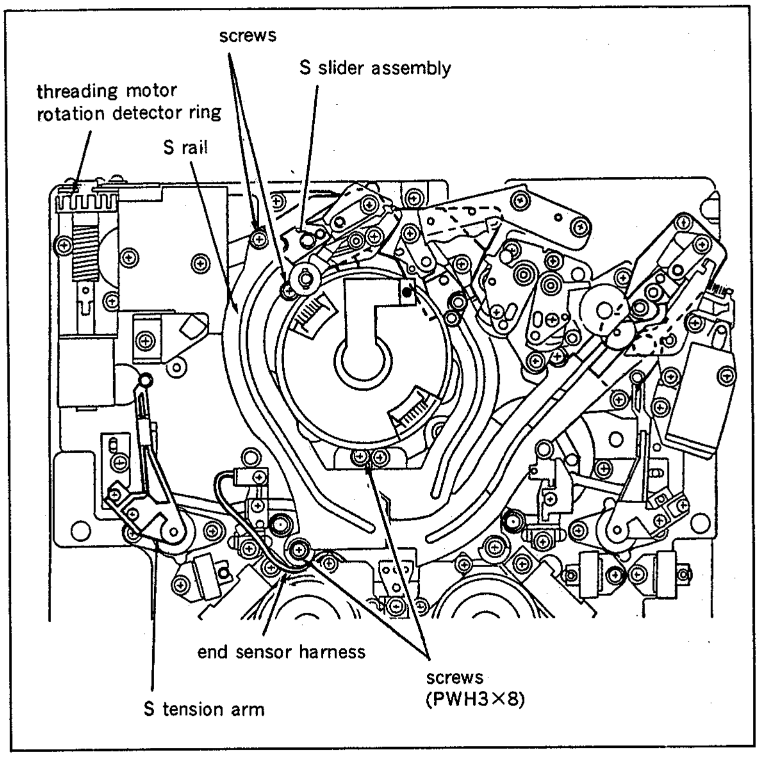
Adjustment of tape running

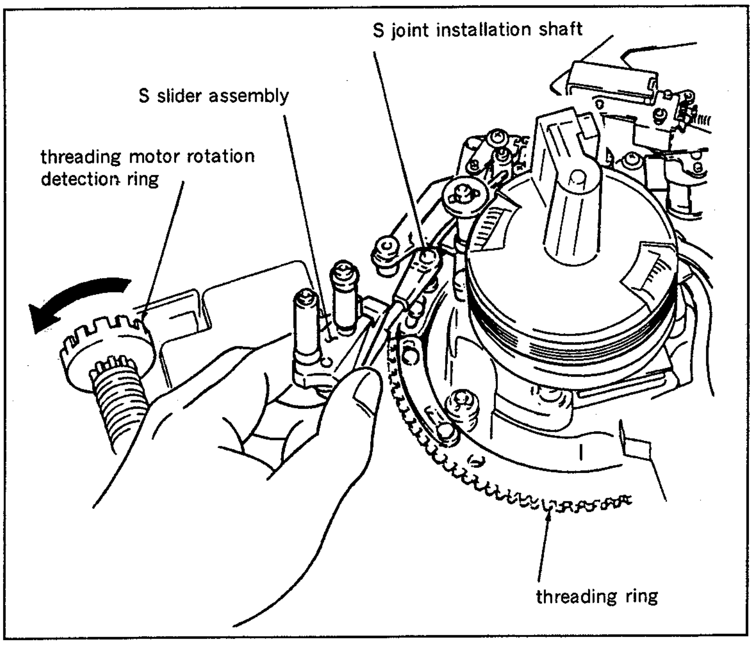
Removal

1. Turn a threading motor rotation detection ring of a threading motor block in the clockwise direction by fingers looking it from the front, and put a S slider assmbly to 5 mm back from the threading completion mode. At this time S, T and P slider assemblies are moved on ST base and P base.
2. Unhook an end sensor harness as shown in the figure from a clamper of a S rail.
3. Remove four screws (PWH3×8) that holds the S rail, and remove the S rail.

Note :Pay particular attention not to cause damage to a drum and tape guide during removal.

4. Hold the S slider assembly with hand and turn the motor rotation detection ring of the threading motor block in the counterclockwise direction by fingers until the S joint installation shaft on a threading ring comes to the position as shown in the figure.

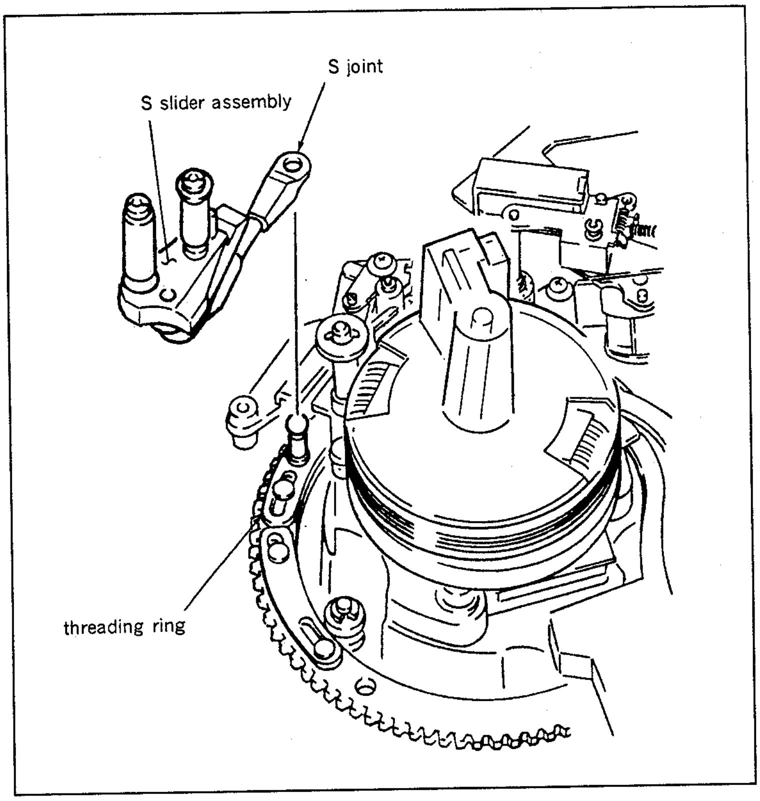

screws
S slider assembly
threading motor
rotation detector ring
S rail
end sensor harness
screws
(PWH3×8)
S tension arm


S joint installation shaft
S slider assembly
threading motor rotation
detection ring
threading ring

5. Remove the S joint from a shaft on the threading ring, and remove the S slider assembly from the unit.

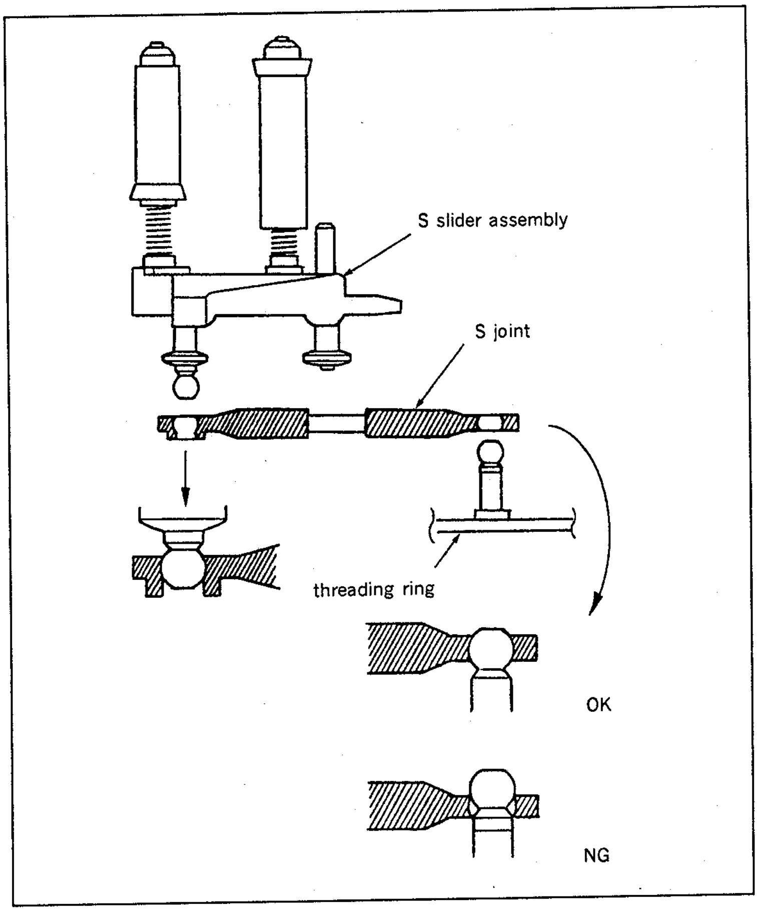
Note :Pay particular attention not to cause damage to the drum during removal.

6. Remove the S joint from the S slider assembly.

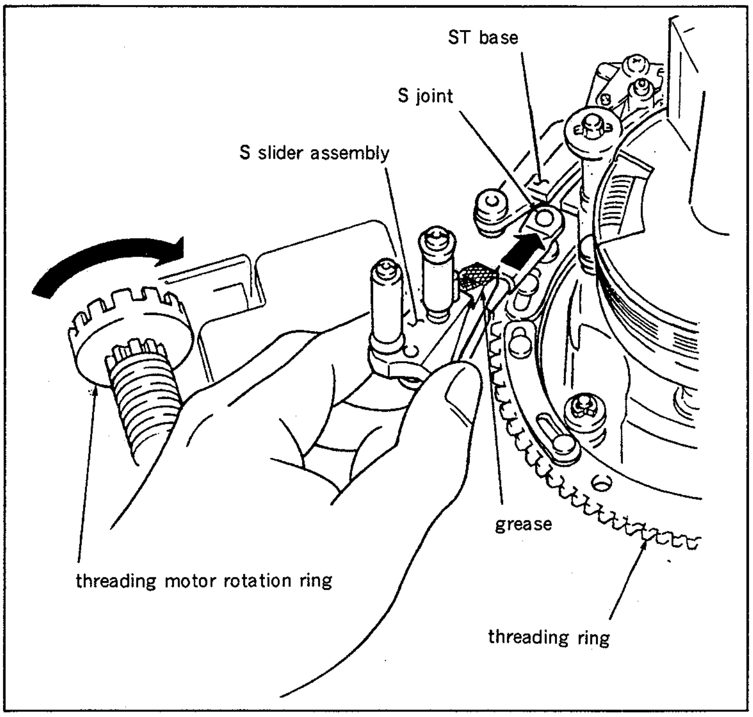

S joint
S slider assembly
threading ring

Installation

7. Clean the contacting surfaces of the S rail with the S slider assembly with a cleaning piece moistened with cleaning fluid.
8. Clean the contacting surfaces of a new S slider assembly with the S rail with a cleaning piece moistened with cleaning fluid.
9. Insert the S joint to the S slider assembly as show in the figure.


S slider assembly
S joint
threading ring
OK
NG

10. Insert the other end of the S joint into the shaft on the threading ring.
11. Hold the S slider assembly with hand and turn the motor rotation detection ring of the threading motor block in the clockwise direction by fingers, and insert the S slider assembly into the groove of the ST base.
12. Install the S rail to the chassis with four screws (PWH3×8).



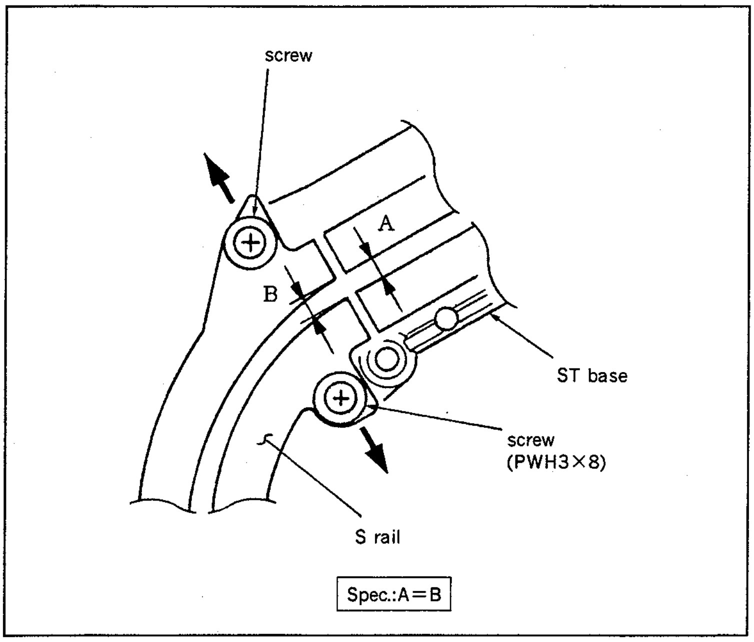
Note 1 : Pay particular attention not to cause damage to the drum and the tape guide.

Note 2 : When installing the S rail, push the S rail in the direction of the arrors so that align the width of groove of the ST base and S rail.

13. After turning the motor rotation detection ring in the counterclockwise direction with fingers, and smear a molyton grease slighly to the part as shown in the figure.

Note 1 : Do not smear the grease to the rail.

Note 2 : Pay particular attention not to smear grease to the tape guide and drum, etc. when smearing grease. If it is smeared by mistake, wipe it off completely with a cleaning piece moistened with cleaning fluid.



14. Turn the motor rotation detection ring in the clockwise and counterclockwise directions by fingers, and make sure that the S slider assembly moves smoothly.

Adjustment after replacement

15. Perform tape running adjustment. (Refer to Section 5-4.)

4-17. T SLIDER ASSEMBLY REPLACEMENT

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Molyton grease	: 7-662-001-41

Replacement flow chart

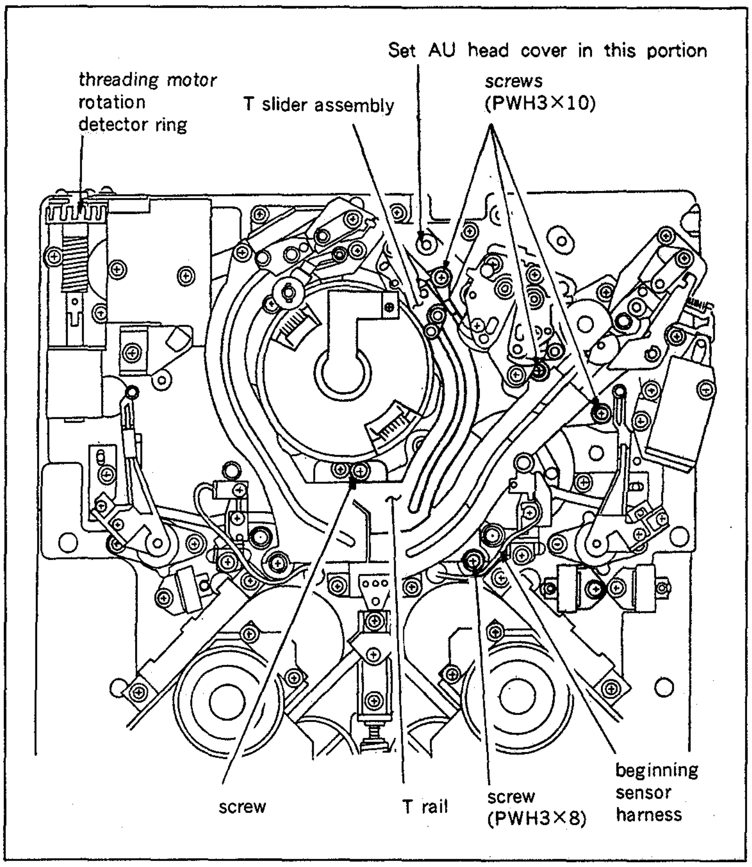
Removal of cleaning roller block

Replacement of T slider assembly

Installation of cleaning roller block

Adjustment of cleaning roller block position

Adjustment of tape rynning

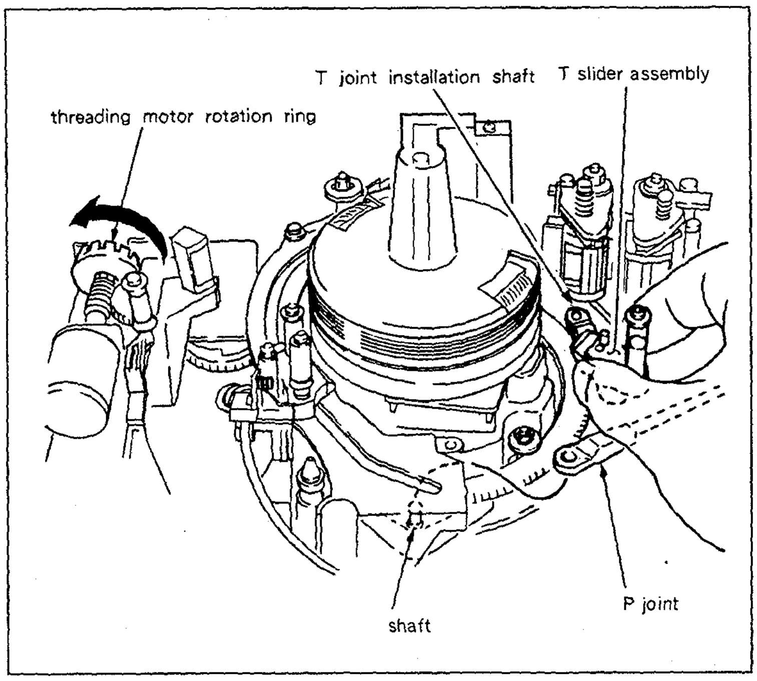

Set AU head cover in this portion
threading motor rotation detector ring
T slider assembly
screws (PWH3×10)
screw
T rail
screw (PWH3×8)
beginning sensor harness

Removal

1. Remove a cleaning roller block. (Refer to steps (1) and (2) in Section 5-6.)
2. Remove an AU head cover. At this time, the harness clamper of the drum comes off together. (Refer to step (3) in Section 4-3.)
3. Rotate a drive gear by fingers so that a reel table is placed to the L cassette position.
4. Turn a threading motor rotation detection ring of a threading motor block in the clockwise direction by fingers looking it from the front, and put a T slider assmbly to 5 mm back from the threading completion mode. At this time S, T and P slider assemblies are moved on ST base and P base.
5. Unhook a tape beginning sensoe harness from a T rail.
6. Remove five screws (PWH3×10 and PWH 3×8) that holds the T rail, and remove the T rail.

Note :Pay particular attention not to cause damage to a drum and tape guide during removal.

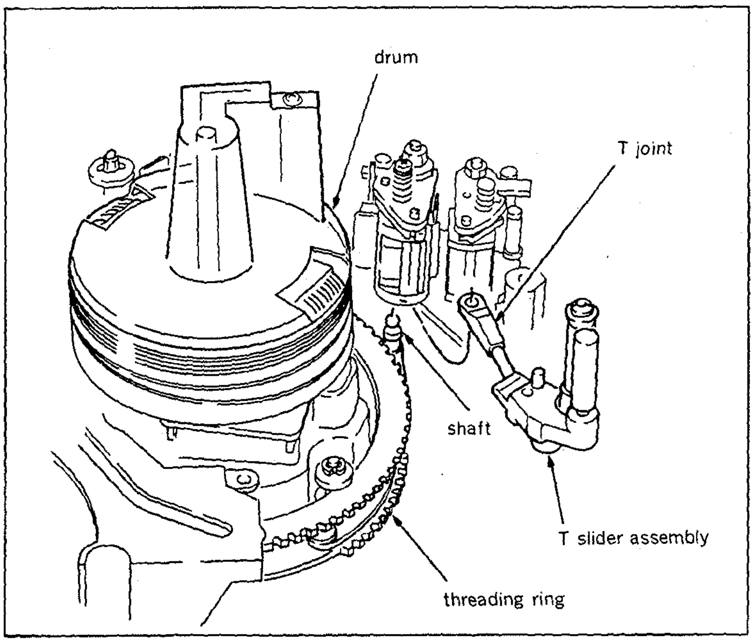
7. Remove the P joint which is connected with P slider assembly and threading ring from a shaft on the threading ring.
8. Hold the T slider assembly with hand and turn the motor rotation detection ring of the threading motor block in the counterclockwise direction by fingers until the T joint installation shaft on the threading ring comes to the position as shown in the figure.


T joint installation shaft
T slider assembly
threading motor rotation ring
shaft
P joint

9. Remove the T joint from the shaft on the threading ring, and remove the T slider assembly from the unit.

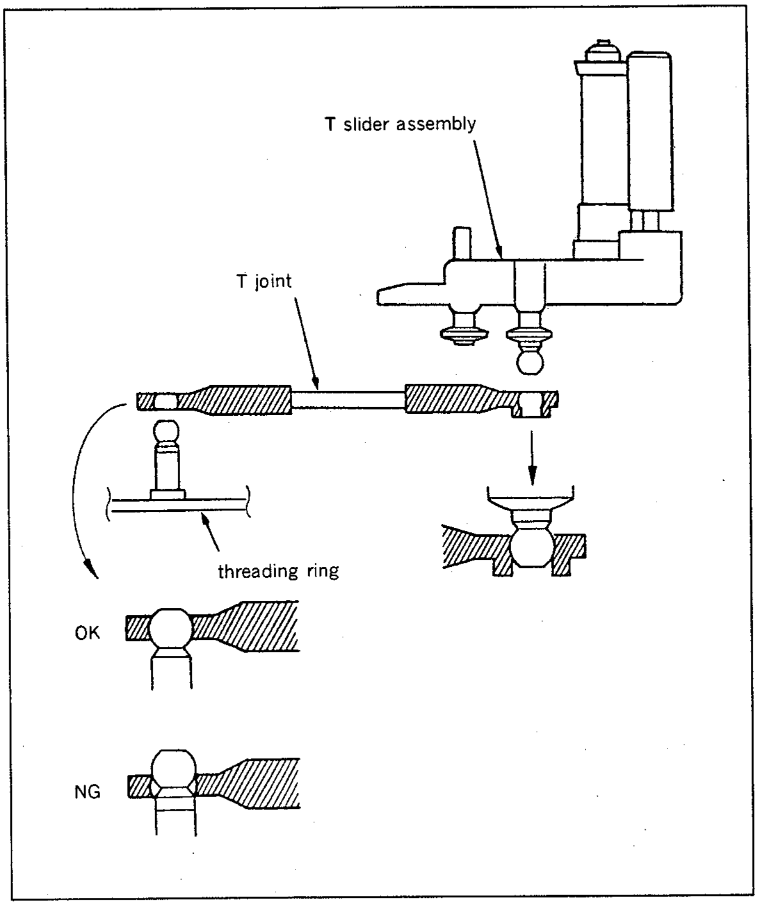
Note :Pay particular attention not to cause damage to the drum during removal.

10. Remove the T joint from the T slider assembly.

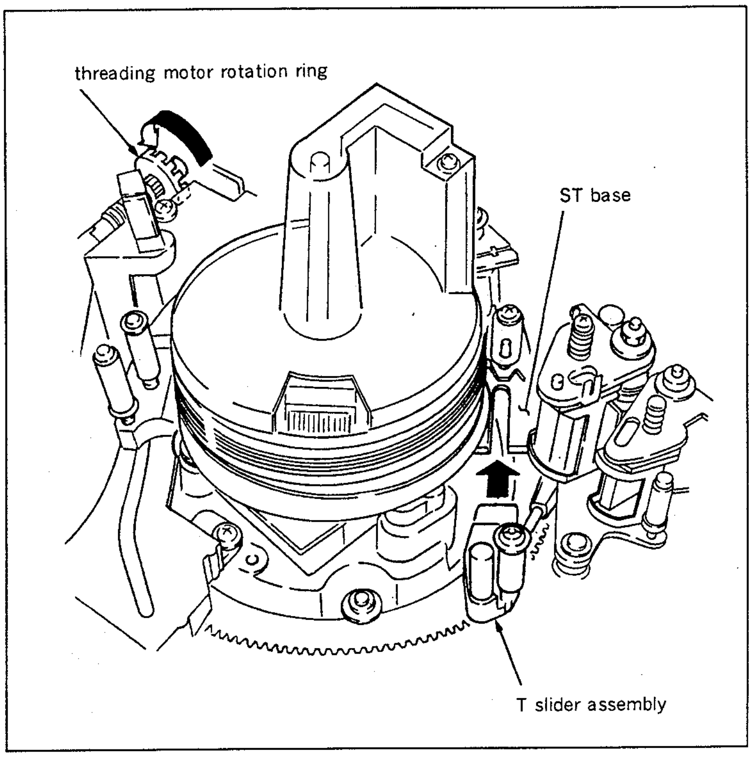

drum
T joint
shaft
T slider assembly
threading ring

Installation

11. Clean the contacting surfaces of the T rail with the T slider assembly with a cleaning piece moistened with cleaning fluid.
12. Clean the contacting surfaces of a new T slider assembly with the T rail with a cleaning piece moistened with cleaning fluid.
13. Insert the T joint to the T slider assembly as show in the figure.


T slider assembly
T joint
threading ring
OK
NG

14. Insert the other end of the T joint into a shaft on the threading ring.
15. Hold the T slider assembly with hand and turn the motor rotation detection ring of the threading motor block in the counterclockwise direction by fingers, and insert the T slider assembly into the groove of the ST base.
16. Insert the P joint into the shaft on the threading ring.


threading motor rotation ring
ST base
T slider assembly

17. Install the T rail to the chassis with five screws (PHW3×10 and PHW3×8).

Note 1 : Pay particular attention not to cause damage to the drum and the tape guide.

Note 2 : When installing the T rail, align the width of groove of the ST base and T rail, and at the same time align the width of groove of the P base and T rail.

Note 3 : When fastening the T rail with the screw (PWH3×10) shown in the figure, pay particular attention not to twist the T rail.

18. After turning the motor rotation detection ring in the counterclockwise direction with fingers, and smear a molyton grease slighly to the part as shown in the figure.

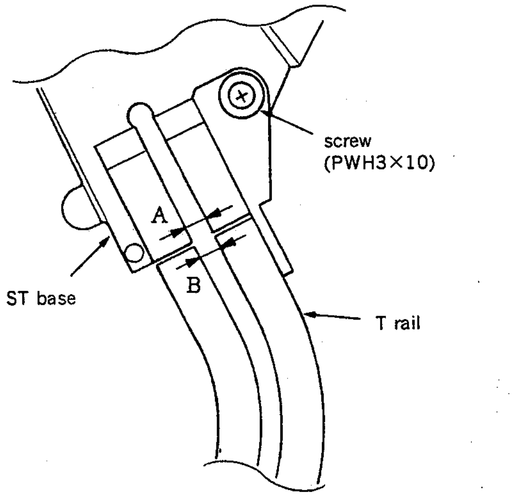
Note 1 : Do not smear the grease to the rail.

Note 2 : Pay particular attention not to smear grease to the tape guide and drum, etc. when smearing grease. If it is smeared by mistake, wipe it off completely with a cleaning piece moistened with cleaning fluid.

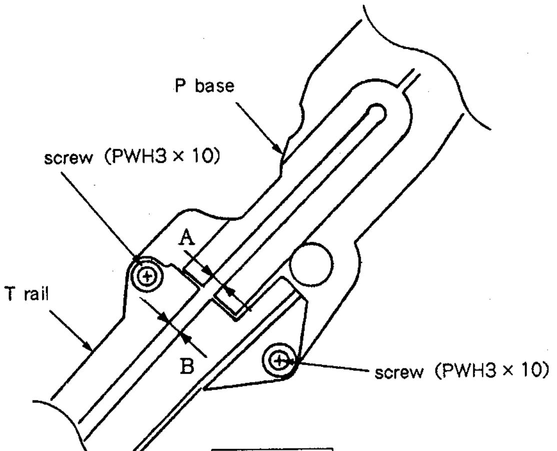
19. Turn the motor rotation detection ring in the clockwise and counterclockwise directions by fingers, and make sure that the T slider assembly moves smoothly.
20. Install the AU head cover together with the drum harness clamper.
21. Install the cleaning roller block. (Refer to steps(7) and (8) in Section 4-6.)

Adjustment after replacement

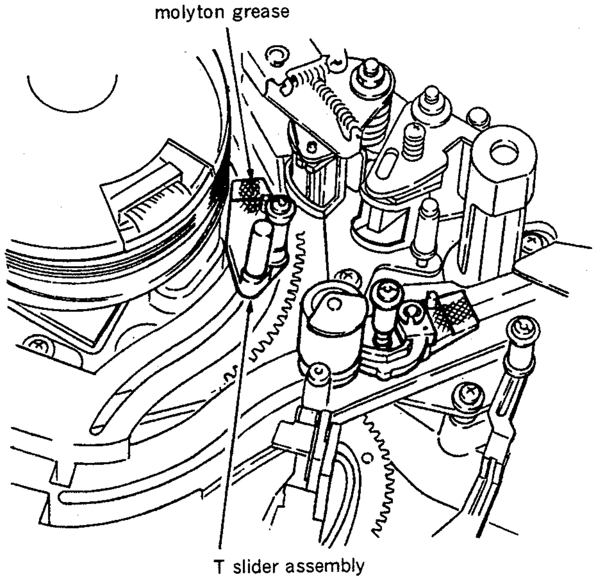
22. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)
23. Perform tape running adjustment. (Refer to Section 5-4.)



Spec.: A=B



Spec.: A=B



4-18. P SLIDER ASSEMBLY REPLACEMENT

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Molyton grease	: 7-662-001-41

Replacement flow chart

Replacement of P slider assembly

Adjustment of cleaning roller block position

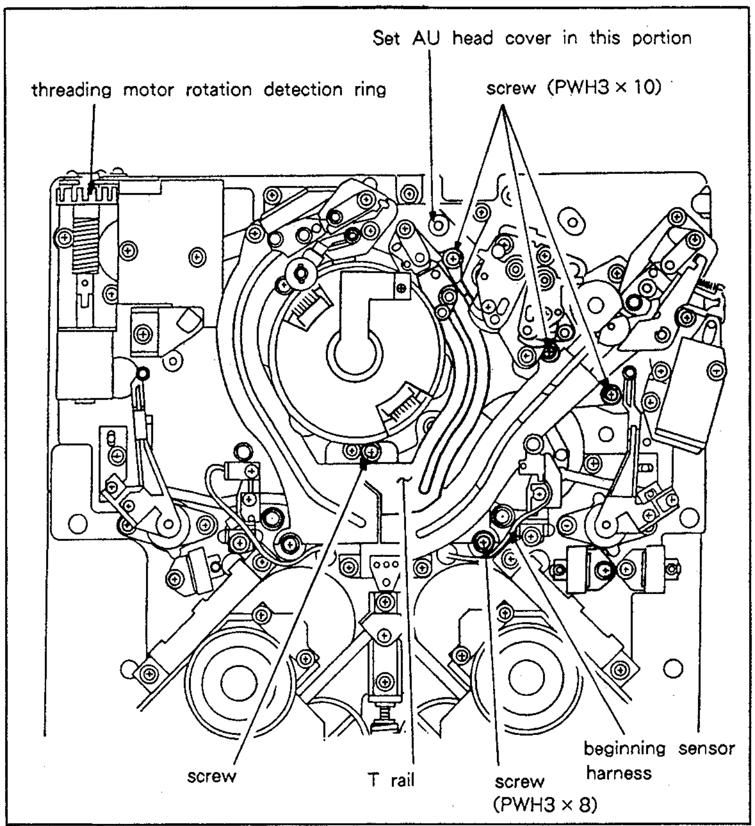
Adjustment of tape running

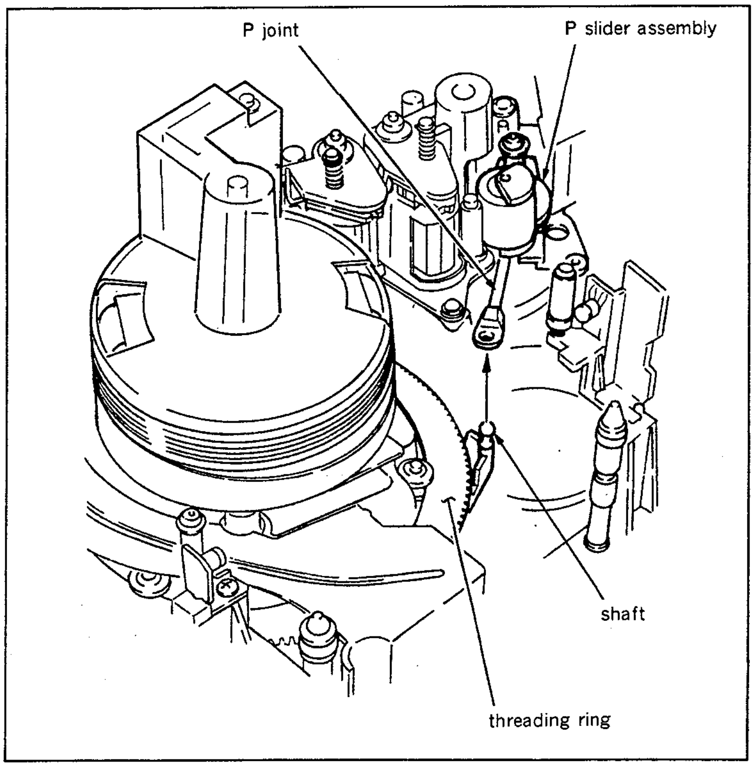
Removal

1. Remove a cleaning roller block. (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover. At this time, the harness clamper of the drum comes off together. (Refer to step (3) in Section 4-3.)
3. Rotate a drive gear by fingers so that a reel table is placed to the L cassette position.
4. Turn a threading motor rotation detection ring of a threading motor block in the clockwise direction by fingers looking it from the front, and put a P slider assmbly to 5 mm back from the threading completion mode. At this time S, T and P slider assemblies are moved on ST base and P base.
5. Uuhook the tape beginning sensor harness from the T rail.
6. Remove five screws (PWH3×10 and PWH 3×8) that holds the T rail, and remove it.

Note :Pay particular attention not to cause damage to a drum and tape guide during removal.

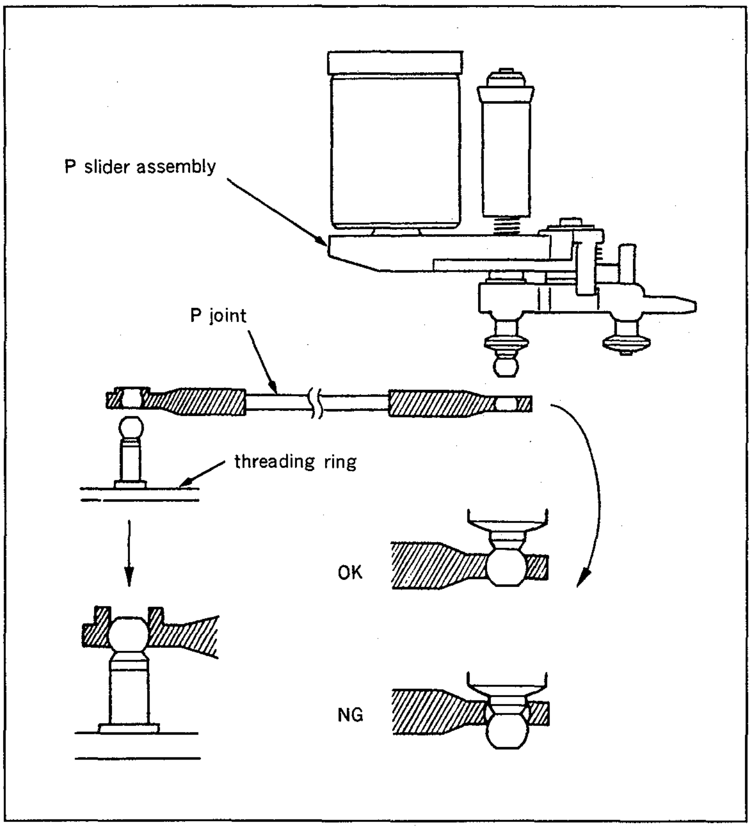
7. Remove a P joint which connects the P slider assembly with a threading ring from a shaft on the threading ring.
8. Remove the P joint from the P slider assembly.


Set AU head cover in this portion
threading motor rotation detection ring
screw (PWH3 x 10)
screw
T rail
screw
(PWH3 x 8)
beginning sensor
harness

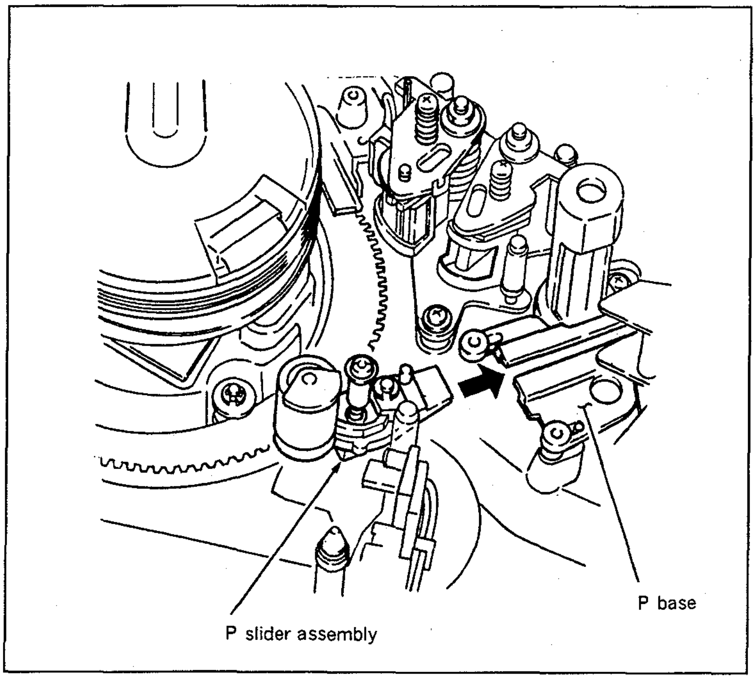

P joint
P slider assembly
shaft
threading ring

Installation

9. Clean the contacting surfaces of the T rail with the T slider assembly and P slider assembly with a cleaning piece moistened with cleaning fluid.
10. Clean the contacting surfaces of a new P slider assembly with the T rail with a cleaning piece moistened with cleaning fluid.
11. Insert the P joint to the P slider assembly as shown in the figure.


P slider assembly
P joint
threading ring
OK
NG

12. Insert the P slider assembly into the groove of the ST base as shown in the figure.

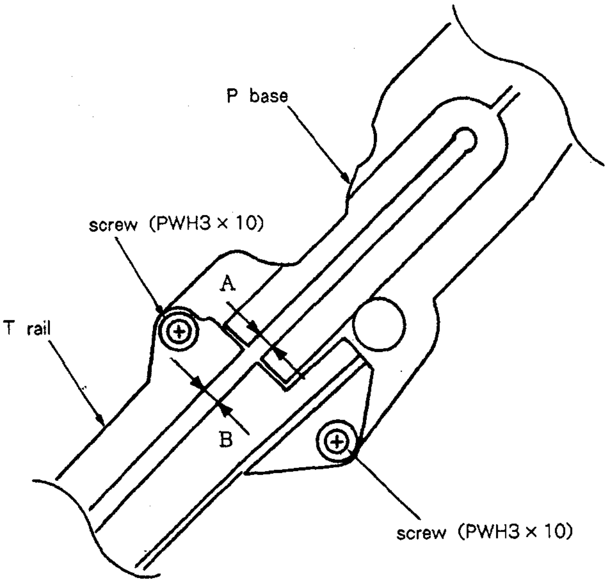

P base
P slider assembly

13. Insert the P joint into the shaft on the threading ring.
14. Install the T rail to the chassis with five screws (PWH3×10 and PWH3×8).

Note 1 : Pay particular attention not to cause damage to the drum and the tape guide.

Note 2 : When installing the T rail, align the width of groove of the ST base and T rail, and align the width of groove of P base and T rail.

Note 3 : When fastening the T rail with the screw (PWH3×10) shown in the figure, pay particular attention not to twist the T rail.

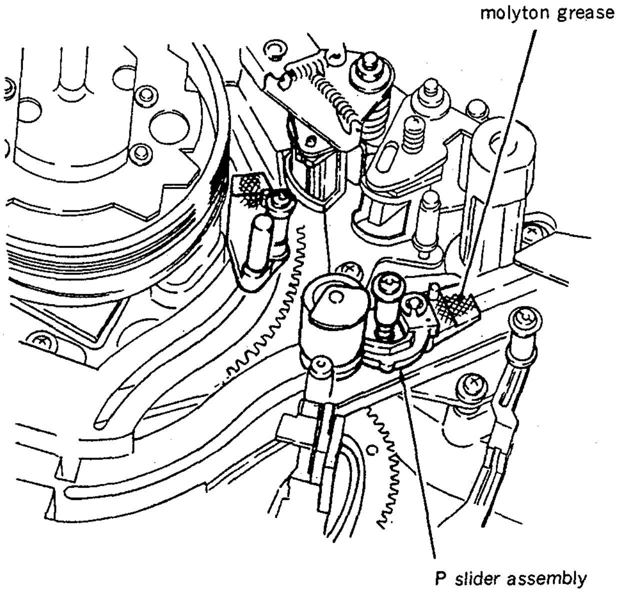


Spec. : A = B

15. After turning the motor rotation detection ring in the counterclockwise direction with fingers, and smear a molyton grease slighly to the part as shown in the figure.

Note 1 : Do not smear the grease to the rail.

Note 2 : Pay particular attention not to smear grease to the tape guide and drum, etc. when smearing grease. If it is smeared by mistake, wipe it off completely with a cleaning piece moistened with cleaning fluid.



16. Turn the motor rotation detection ring in the clockwise and counterclockwise directions by fingers, and make sure that the P slider assembly moves smoothly.
17. Install the AU head cover together with the drum harness clamper.
18. Install the cleaning roller block. (Refer to steps (7) and (8) in Section 4-6.)

Adjustment after replacement

19. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)
20. Perform tape running adjustment. (Refer to Section 5-4.)

4-19. S TENSION REGULATOR ARM ASSEMBLY REPLACEMENT

Tool

L shaped wrench (across flat has 0.89 mm)
: 7-700-736-06

Replacement flow chart

Replacement of S tension regulator arm assembly

Adjustment of S tension regulator arm operating position

Adjustment of S tension regulator sensor sensitivity

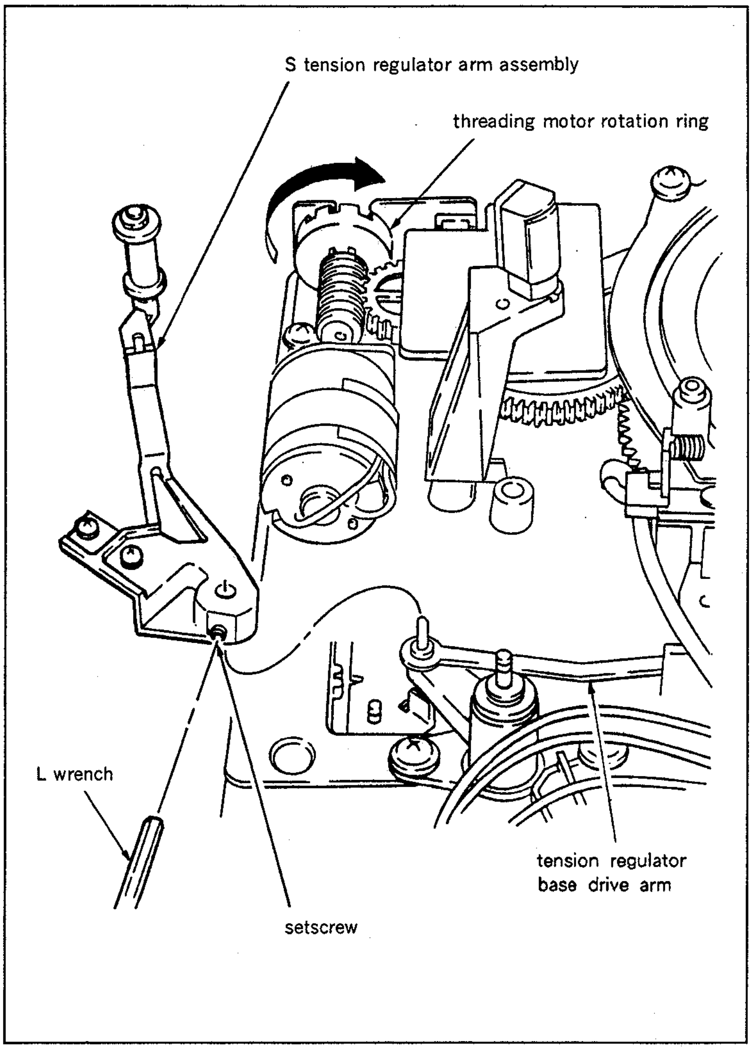
(Be sure to replace a T tension regulator arm and TR-73 board which places under the T tension regulator arm at the back side of the chassis in this step, if necessary.)

Adjustment of FWD back tension

Adjustment of REV back tension

Adjustment of tape running

Confirmation of video tracking


S tension regulator arm assembly
threading motor rotation ring
L wrench
setscrew
tension regulator base drive arm

Removal

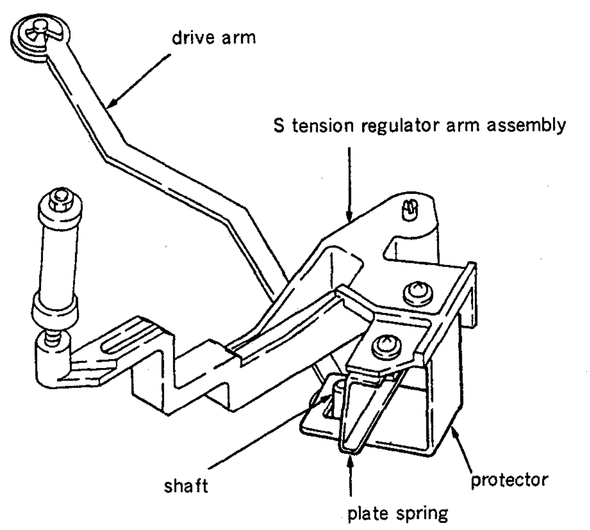
1. Turn a threading motor rotation detection ring of a threading motor block in the clockwise direction by fingers looking from the front, and put the unit into the threading completion mode.
2. Loosen a setscrew shown in the figure holding a S tension regulator arm assembly, and lift the S tension regulator arm assembly straight up to remove.

Installation

3. Install a new S tension regulator arm assembly to a shaft of a tension regulator base so that a protector, plate spring and shaft of a drive arm are assembled as shown in the figure, and tighten a setscrew.

Adjustment after replacement

4. Perform S tension regulator arm operating position adjustment. (Refer to step ⑫ and later in Section 4-19-1.)
5. Perform S tension sensor sensitivity adjustment. (Refer to Section 4-19-2.)
6. Perform FWD back tension adjustment. (Refer to Section 4-19-3.)
7. Perform REV back tension adjustment. (Refer to Section 4-19-4.)
8. Perform tape running adjustment. (Refer to Section 5-4.)
9. Perform confirmation of video tracking adjustment. (Refer to Section 5-5.)



4-19-1. S Tension Regulator Arm Operating Position Adjustment

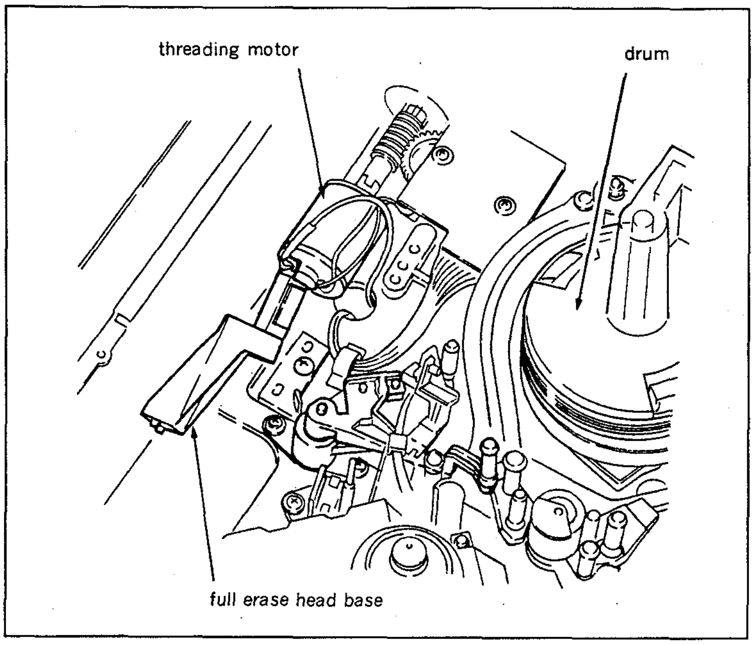
- Be sure to perform this adjustment without installing a cassette compartment.

Tools

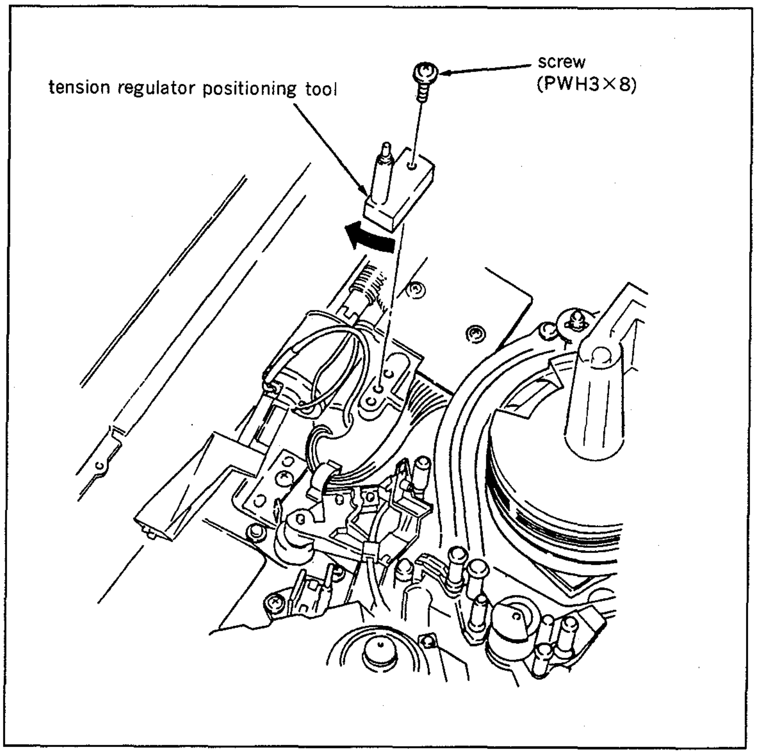
Cassette reference plate (L):	J-6320-880-A
Tension regulator positioning tool	: J-6322-370-A
Dial tension gauge (50 g)	: J-6327-850-A
Tension measurement tape	: J-6327-930-A (Refer to Section 4-1.)
Nonslip rubber sheet	: J-6327-980-A (Refer to Section 4-1.)
Wire clearance gauge	: J-6152-450-A
Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01

Check

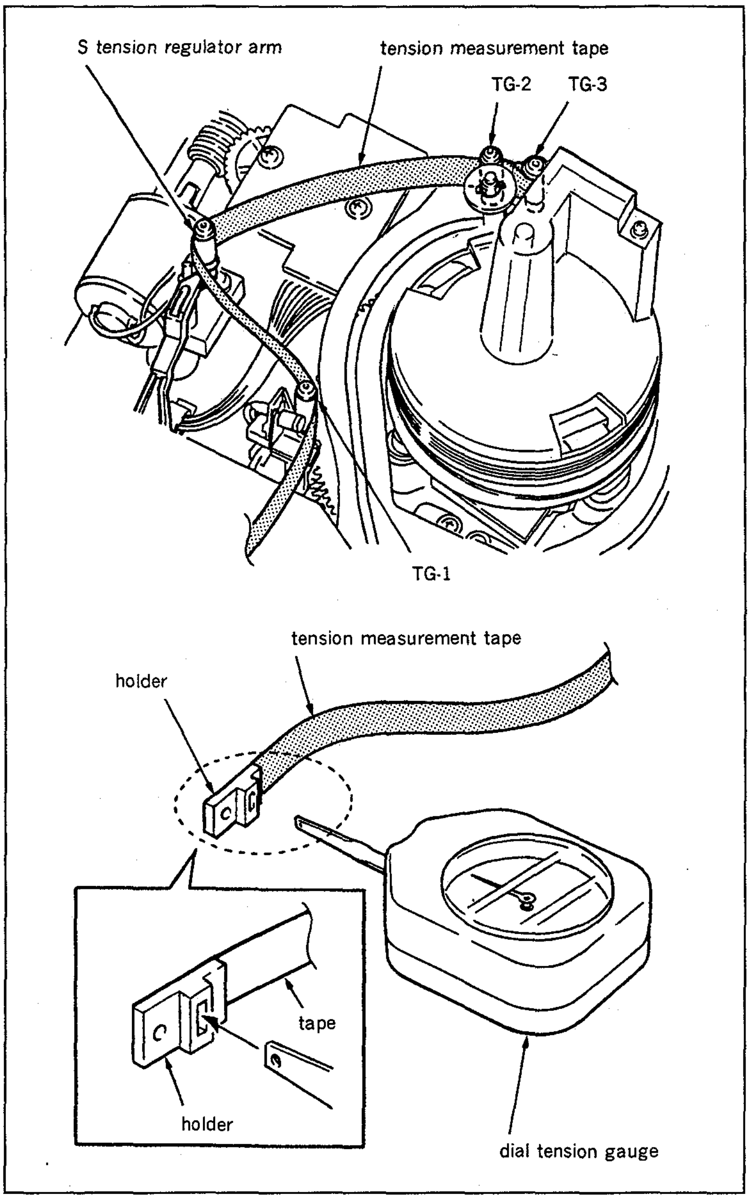
1. Remove a screw (PHW3×8) and remove a full erase head base, and place it into the position as shown in the figure.


threading motor
drum
full erase head base

2. Install a tension regulator positioning tool onto the place where the full erase head base was installed.
While pressing the tool in the direction to the arrow, tighten it with screw (PWH3×8).


tension regulator positioning tool
screw
(PWH3×8)

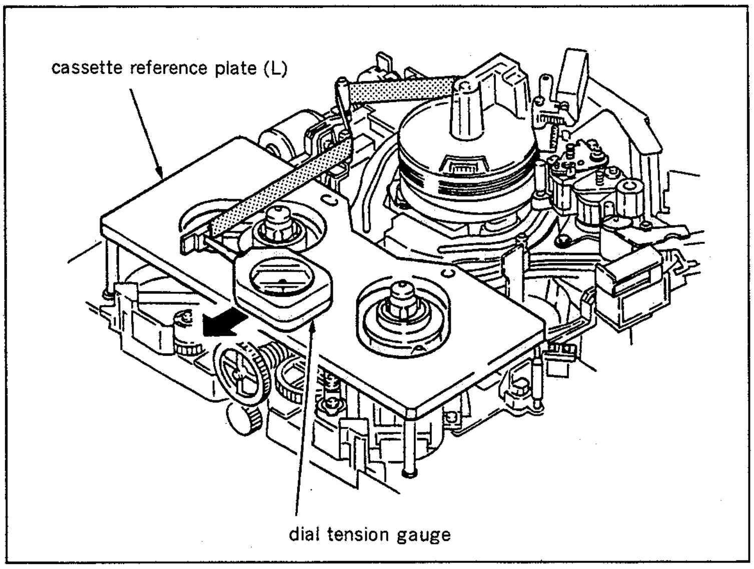
3. Put Bit4 of S601 on SS-48DP board in CLOSE state.
4. Confirm that a reel table is in S cassette position. When it is in L cassette position, turn the POWER to ON once, change it to S cassette position, according to the Maintenance Menu "B027: REEL POSITION"
5. Place the cassette reference plate (L) on four cassette pillars.
6. Turn the POWER to ON. A threading ring rotates automatically, and put the unit into the threading completion mode. Press STANDBY button to be in STANDBY OFF mode, and stop the rotation of a drum.
7. Put one end of the tension measurement tape into TG-3 tape guide on a S slider assembly as shown in the figure.
8. Thread the tension measurement tape as shown in the figure.
9. Put the tip of the dial tension gauge into the holder of the tension measurement tape.


S tension regulator arm
tension measurement tape
TG-2
TG-3
TG-1
tension measurement tape
holder
tape
holder
dial tension gauge

10. Place the dial tension gauge on the cassette reference plate (L), and move the gauge along the cassette reference plate (L) in the direction shown in the figure until the indication of the gauge shows 42 g.

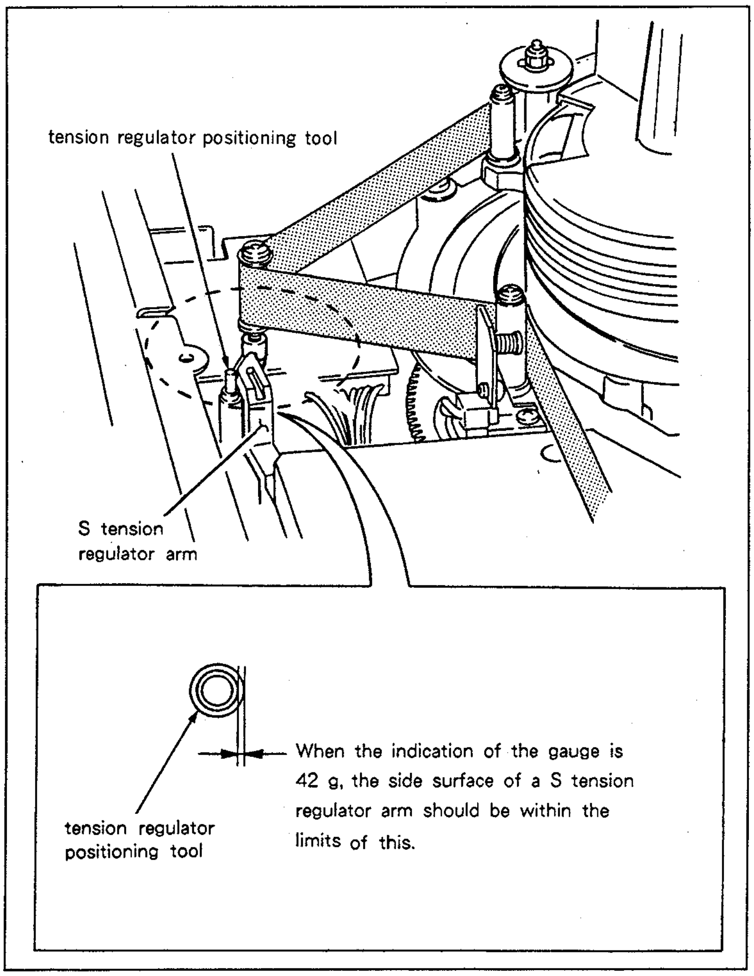
Note 1 : Confirm that the tension measurement tape is placed on every tape guide roller properly.

Note 2 : Pull the tension measurement tape in the parpendicular direction to the cassette reference plate (L).


cassette reference plate (L)
dial tension gauge

11. When the indication of the gauge is 42 g, confirm that the side surface of a S tension regulator arm is located within the limits of the tension regulator positioning tool as shown in the figure.

    If the specification is satisfied, perform step (17) and later.
    If the specification is not satisfied, perform step (12) and later.

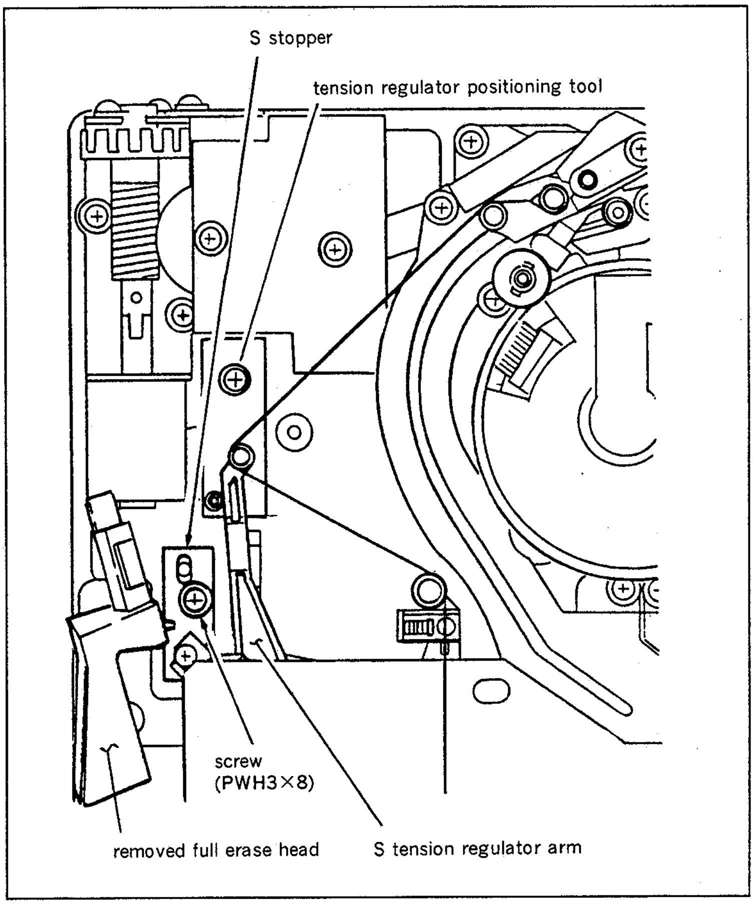

tension regulator positioning tool
S tension regulator arm
tension regulator positioning tool
When the indication of the gauge is 42 g, the side surface of a S tension regulator arm should be within the limits of this.

Adjustment

12. Loosen a fixing screw (PWH3×8) of a S stopper for 1/3 to 1/2 turn.
13. Perform step ⑩.
14. While keeping the state of step ⑩, insert a 3 mm flatblade screwdriver into notch of the S stopper, and adjust position of the S stopper so that the specification is satisfied.

Note :Pay particular attention not to cause damage to the removed full erase head which is placed near by the unit during adjustment.

15. Tighten the fixing screw (PWH3×8) of the S stopper.
16. Reconfirm that the specificatin is satisfied according to the check procedure.
17. After adjustment, take out the tension measurement tape from the unit, and press EJECT button to put into the unthreading completion mode, then take out the cassette reference plate (L).
18. Turn the POWER to OFF, and put Bit4 of S601 on SS-48DP board in OPEN state.
19. Remove the tension regulator positioning tool, and install the full erase head base.
20. Clean the tape running surfaces of TG-1, TG-2, TG-3, tension regulator roller and full erase head with a cleaning piece moistened with cleaning fluid.



4-19-2. S Tension Sensor Sensitivity Adjustment

- It is impossible to only confirm whether S tension sensor sensitivity is being properly adjusted. Be sure to adjust S tension sensor sensitivity as the following procedures below, and save the adjustment data in NOV RAM.
- Be sure to perform this adjustment after removing a cassette compartment.

Tools

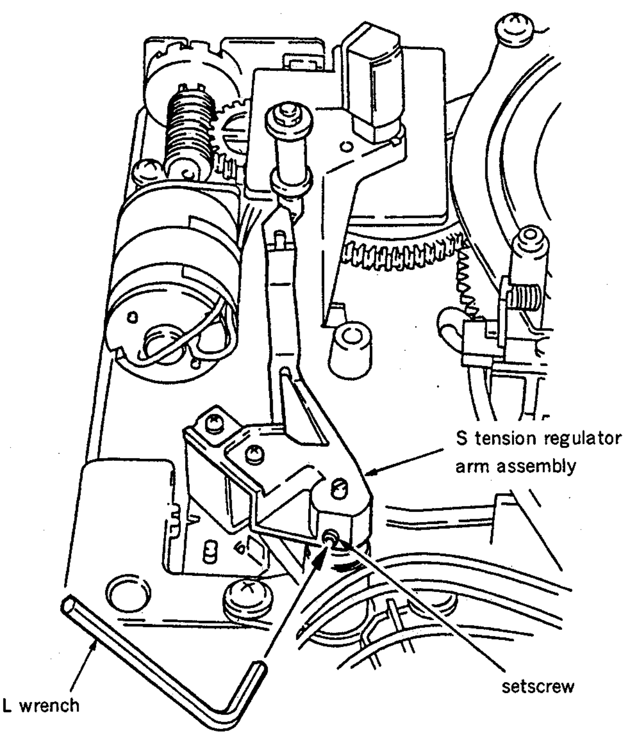
Cassette reference plate : J-6080-008-A
Dial tension gauge (50g) : J-6327-850-A
Tension measurement tape : J-6327-930-A
(Refer to Section 4-1.)
L shaped wrench (across flat has 0.89 mm)
: 7-700-736-06

Preparation

Connect a video monitor with MONITOR connector, and display characters.

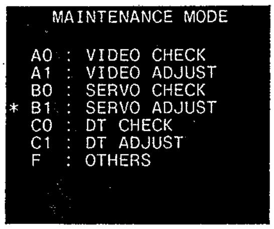
Adjustment

1. Turn the POWER to OFF, and put Bit4 of S601 on SS-48DP board in CLOSE state.
2. Confirm that a reel table is in S cassette position. When it is in L cassette position, turn the POWER to ON once, change it to S cassette position, according to the Maintenance Menu "B027 : REEL POSITION"
3. Loosen a setscrew of a S tension regulator arm assembly for 1/4 to 1/3 turn.
4. Turn the POWER to ON. When the POWER is turned ON, threading automatically starts. Press EJECT button to put the unit in EJECT completion mode.
5. Push S302 and put the unit into maintenance mode.
6. Press the search dial to enter the jog mode, and move * mark to "B1: SERVO ADJUST" which is displaying on the monitor screen with the search dial.
7. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.
8. Move * mark to "B112: S TENSION SENSOR" which is displaying on the monitor screen with the search dial.
9. Press S302 on SS-48DP board to execute "S TENSION SENSOR" menu.
10. Place a cassette reference plate on four cassette pillars.



S601-4/SS-48DP : CLOSE

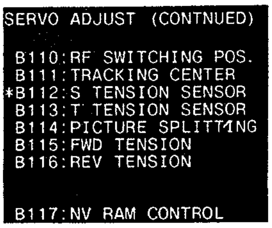
press S302



```
MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
  B0 : SERVO CHECK
* B1 : SERVO ADJUST
  C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

select with search dial

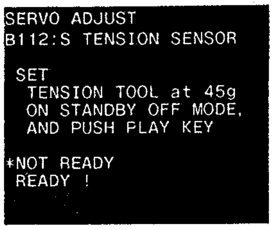
press S302



```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
*B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION

 B117:NV RAM CONTROL
```

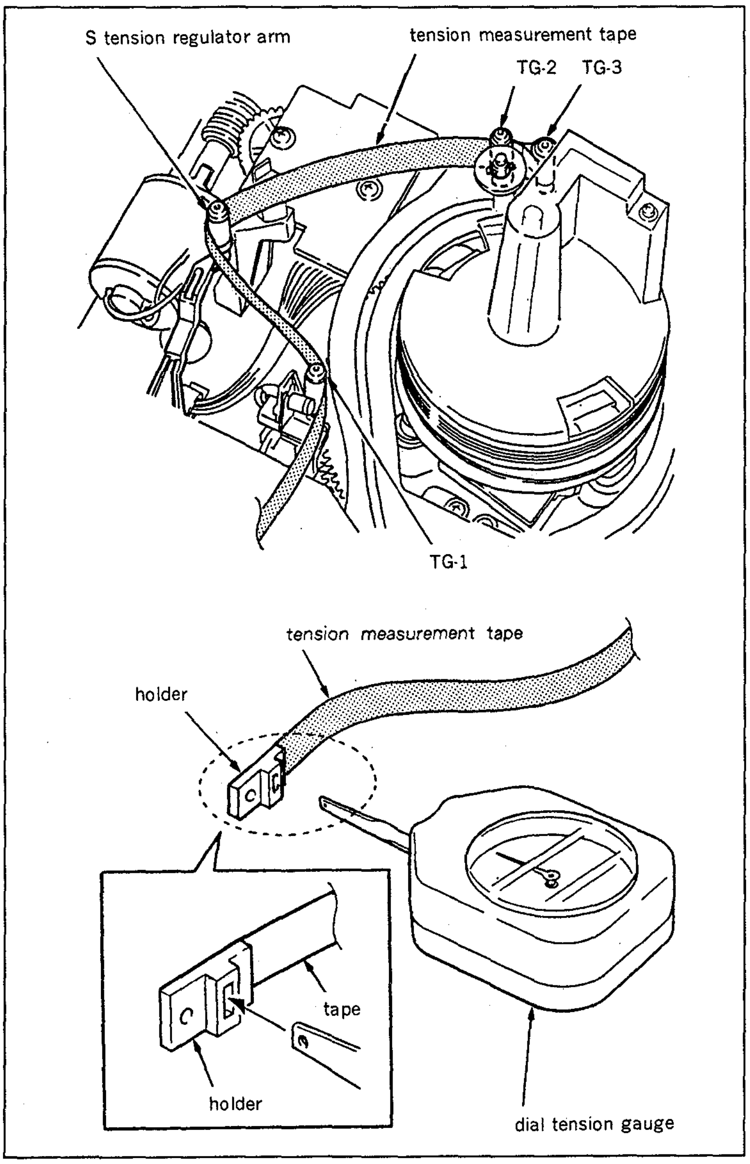
select with search dial

press S302



```
SERVO ADJUST
B112:S TENSION SENSOR

 SET
  TENSION TOOL at 45g
  ON STANDBY OFF MODE,
  AND PUSH PLAY KEY

*NOT READY
 READY !
```

11. Press STOP button to put the unit into the threading completion mode. Then press STANDBY button to be in STANDBY OFF mode, and stop the rotation of a drum.
12. Put one end of the tension measurement tape into TG-3 tape guide on a S slider assembly as shown in the figure.
13. Thread the special made tension measuring tape as shown in the figure.
14. Put the tip of the dial tension gauge into the holder of the special made tension measuring tape.

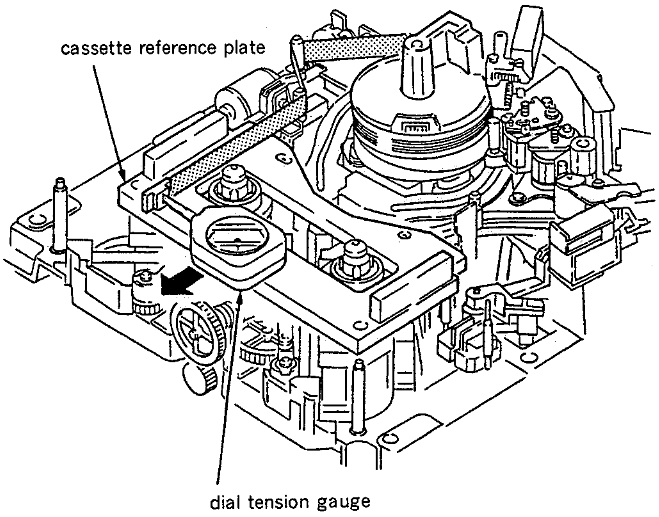

S tension regulator arm
tension measurement tape
TG-2
TG-3
TG-1
tension measurement tape
holder
tape
holder
dial tension gauge

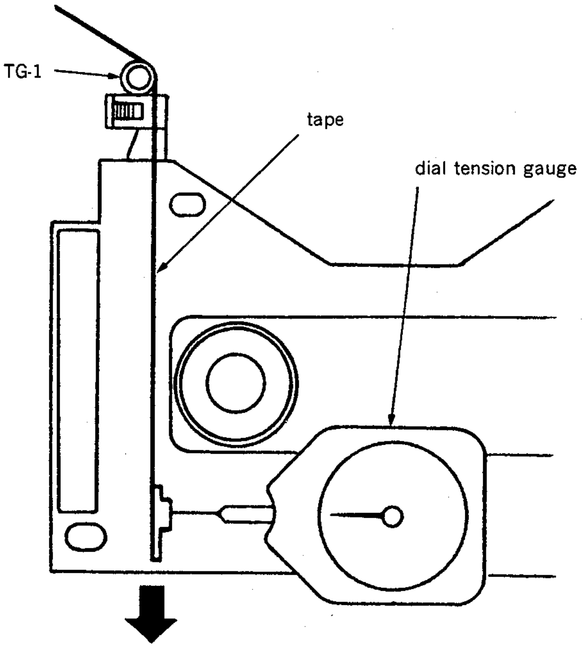
15. Place the dial tension gauge on the cassette reference plate, and move the gauge along the cassette reference plate in the direction shown in the figure until the indication of the gauge shows 45 g.

Note 1 : Confirm that the tension measurement tape is placed on every tape guide roller properly.

Note 2 : Pull the tension measurement tape in the parpendicular direction to the cassette reference plate.

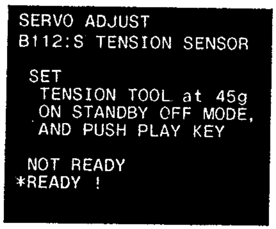
Note 3 : Keep the condition of step (15) when performing steps (16) through (20).





Pull the tape in the parpendicular direction to the cassette reference plate.

press PLAY button



```
SERVO ADJUST
B112:S TENSION SENSOR

 SET
  TENSION TOOL at 45g
  ON STANDBY OFF MODE,
  AND PUSH PLAY KEY

 NOT READY
*READY !
```

select with search dial

press S302

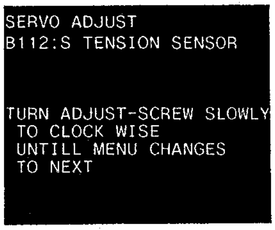
16. Press PLAY button.
17. Move * mark to "READY" which is displaying on the monitor screen with the search dial.
18. Press S302 on SS-48DP board.
19. First, use a flatblade screwdriver to rotate the adjusting screw of the S tension regulator arm assembly clockwise slowly until the display on the monitor screen changes (turn three to four rotation).
    Then rotate the adjusting screw slowly until data displayed on the monitor screen changes to values between -10 and 10, and the data must be kept in increasing state.

Note 1 : Make sure to rotate the flatblade screwdriver clockwise.

Note 2 : While adjusting screw is rotated, the data will keep on increasing and decreasing. In this adjustment, the data must be kept in increasing state and adjusted to meet the specification.

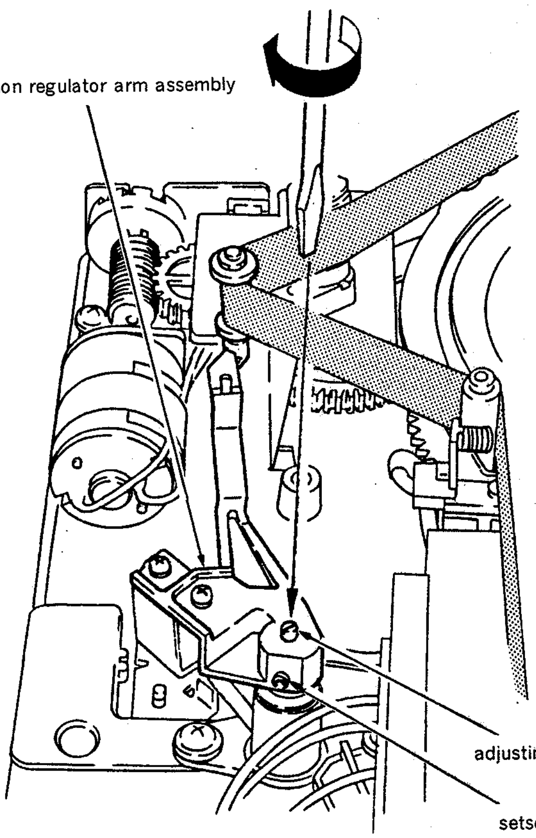
For example : 0001, 0002, 0003, 0004,... data shown in monitor screen is increasing.
0002, 0001, 0000, -0001,...data shown in monitor screen is decreasing.

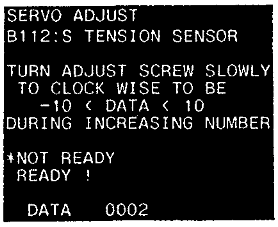
20. While the condition of step (15) is being kept, tighten a setscrew of the S tension regulator arm assembly.



```
SERVO ADJUST
B112:S TENSION SENSOR


TURN ADJUST-SCREW SLOWLY
 TO CLOCK WISE
 UNTILL MENU CHANGES
 TO NEXT
```

Turn adjusting screw clockwise direction





```
SERVO ADJUST
B112:S TENSION SENSOR

TURN ADJUST SCREW SLOWLY
 TO CLOCK WISE TO BE
   -10 < DATA < 10
DURING INCREASING NUMBER

*NOT READY
 READY !

 DATA    0002
```

Rotate the adjusting screw until data displayed changes to value between −10 and 10, (must be kept in increasing state).

tighten a setscrew

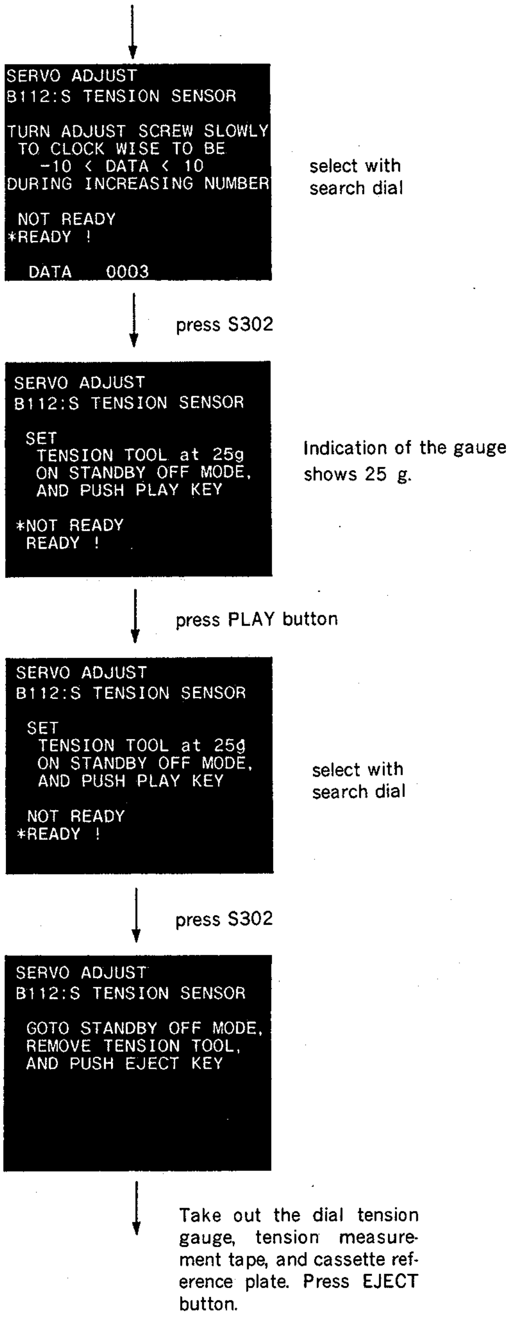
21. Move * mark to "READY" which is displaying on the monitor screen with the search dial.
22. Press S302 on SS-48DP board.
23. After pressing STOP button, press STANDBY button to be in STANDBY OFF mode, and stop the rotation of a drum.
24. Place the dial tension gauge on the cassette reference plate, and move the gauge along the cassette reference plate in the direction shown in the figure until the indication of the gauge shows 25 g.

Note 1 :Confirm that the tension measurement tape is placed on every tape guide roller properly.

Note 2 :Pull the tension measurement tape in the parpendicular direction to the cassette reference plate.

Note 3 :Keep the condition of step (24) when performing steps ㉕ through ㉗.

25. Press PLAY button.
26. Move * mark to "READY" which is displaying on the monitor screen with the search dial.
27. Press S302 on SS-48DP board.
28. After pressing STOP button, press STANDBY button to be in STANDBY OFF mode, and stop the rotation of a drum.
29. Take out the dial tension gauge, tension measurement tape and cassette reference plate from the unit.
30. Press EJECT button to put into the unthreading completion mode.



```
SERVO ADJUST
B112:S TENSION SENSOR

TURN ADJUST SCREW SLOWLY
 TO CLOCK WISE TO BE
   -10 < DATA < 10
DURING INCREASING NUMBER

 NOT READY
*READY !

  DATA    0003
```

select with search dial

press S302

```
SERVO ADJUST
B112:S TENSION SENSOR

 SET
  TENSION TOOL at 25g
  ON STANDBY OFF MODE,
  AND PUSH PLAY KEY

*NOT READY
 READY !
```

Indication of the gauge shows 25 g.

press PLAY button

```
SERVO ADJUST
B112:S TENSION SENSOR

 SET
  TENSION TOOL at 25g
  ON STANDBY OFF MODE,
  AND PUSH PLAY KEY

 NOT READY
*READY !
```

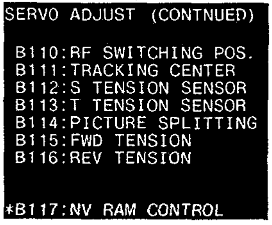
select with search dial

press S302

```
SERVO ADJUST
B112:S TENSION SENSOR

 GOTO STANDBY OFF MODE,
 REMOVE TENSION TOOL,
 AND PUSH EJECT KEY
```

Take out the dial tension gauge, tension measurement tape, and cassette reference plate. Press EJECT button.

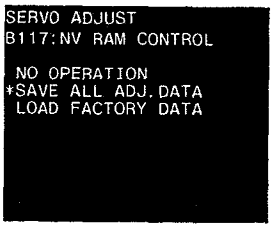
31. Move ∗ mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.
32. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
33. Move ∗ mark to "SAVE ALL ADJ. DATA" with the search dial.
34. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
35. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.
36. Turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION


*B117:NV RAM CONTROL
```

select with search dial

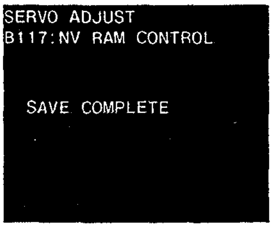
press S302



```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

select with search dial

press S302



```
SERVO ADJUST
B117:NV RAM CONTROL


  SAVE COMPLETE
```

press S303 twice

S601-4/SS-48DP : OPEN

4-19-3. FWD Back Tension Adjustment

- Make sure to perform this adjustment with a cassette compartment is installed.

Tools

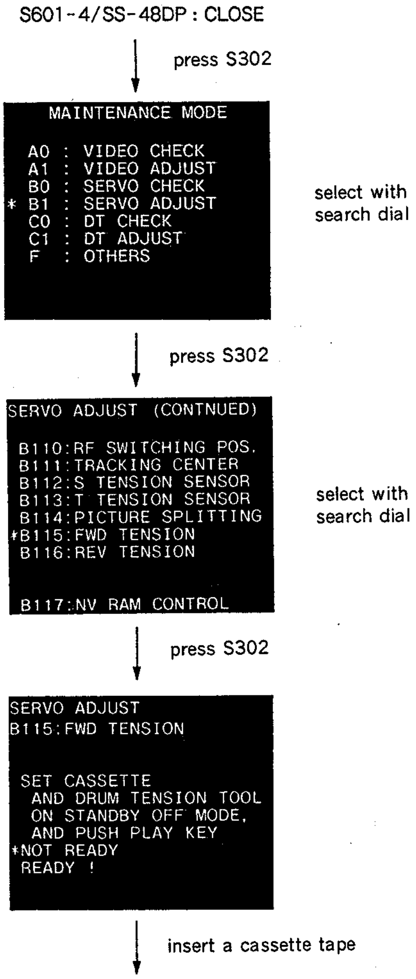
Cassette tape BCT-30M
Drum tension tool (Recommended to use TENTELOMETER U2-H7-UMC).

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

1. Put the unit into EJECT mode.
2. Turn the POWER to OFF, and put Bit4 of S601 on SS-48DP board in CLOSE state.
3. Turn the POWER to ON. Push S302 on SS-48DP board and put the unit into maintenance mode.
4. Press the search dial to enter the jog mode, and move * mark to "B1 : SERVO ADJUST" which is displaying on the monitor screen with the search dial.
5. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.
6. Move * mark to "B115: FWD TENSION" which is displaying on the monitor screen with the search dial.
7. Press S302 on SS-48DP board to execute "FWD TENSION" menu.
8. Insert a BCT-30M cassette tape at about 3 minutes portion from the tape beginning.



S601-4/SS-48DP : CLOSE

press S302

```
      MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
  B0 : SERVO CHECK
* B1 : SERVO ADJUST
  C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

select with search dial

press S302

```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
*B115:FWD TENSION
 B116:REV TENSION

 B117:NV RAM CONTROL
```

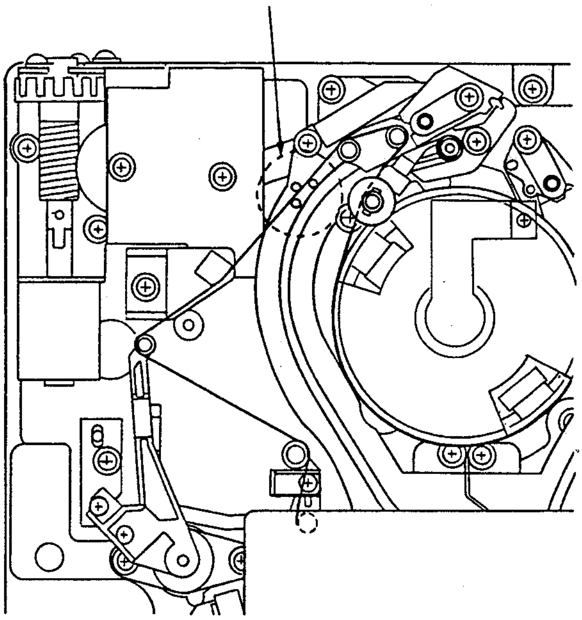
select with search dial

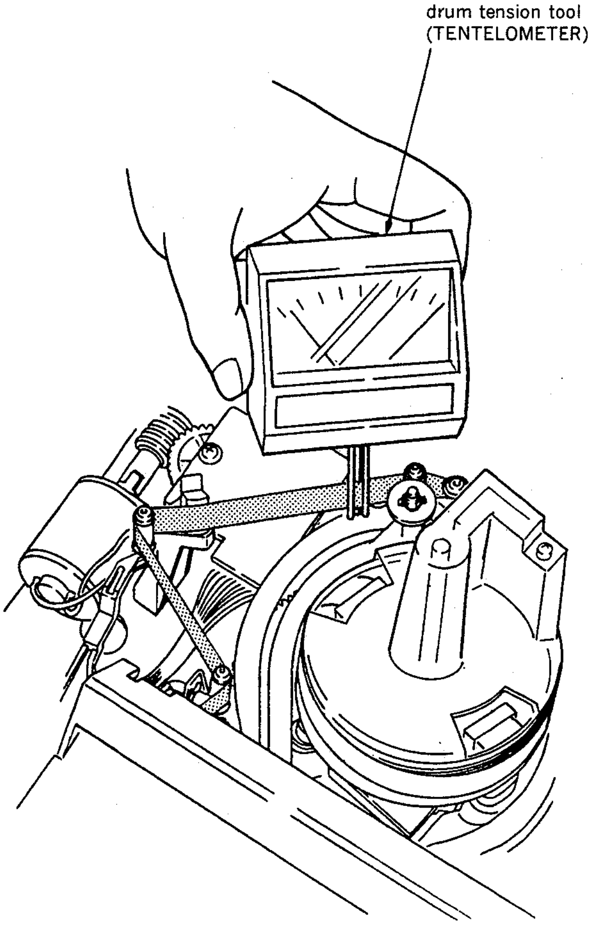
press S302

```
SERVO ADJUST
B115:FWD TENSION


 SET CASSETTE
  AND DRUM TENSION TOOL
  ON STANDBY OFF MODE,
  AND PUSH PLAY KEY
*NOT READY
 READY !
```

insert a cassette tape

9. Hold a drum tension tool (TENTELOMETER), and insert it into the appointed portion as shown in the figure.


set the drum tension tool in this portion.


drum tension tool
(TENTELOMETER)

10. Put the unit into Play mode.

Note : Adjust the slantness of the drum tension tool so that the tape runs smoothly without waveing between the S tension regulator arm and full erase head, and between the full erase head and TG-2 tape guide.

11. Move * mark to "READY" which is displaying on the monitor screen with the search dial.
12. Confirm that the values of the drum tension tool meet the specification.

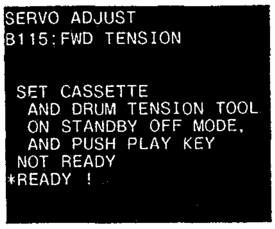
Specification : 41 g to 45 g.

If not to meet the specification, parform step (13) and later.

Adjustment

13. Parform steps from (1) to (11).
14. Press S302 on SS-48DP board.
15. Rotate search dial until the value of drum tension tool meets the specification.
16. If meet the specification, push S302 on SS-48DP board.
17. When the FWD back tension adjustment is finished and does not perform the REV back tension adjustment continuously, press S302 on SS-48DP board, and perform steps (18) and later.
    If the REV back tension adjustment performs after the FWD back tension adjustment continuously, move * mark to "ADJUST REV TENSION" which is displaying on the monitor screen with the search dial, and then press S302.
    After this operation, perform the REV back tension adjustment in accordance with Section 4-19-4.
    (The adjustment data of FWD back tension adjustment and REV back tension adjustment stores together in the NOV RAM.)
18. Remove drum tension tool and then push EJECT button, take out the cassette tape.

press PLAY button



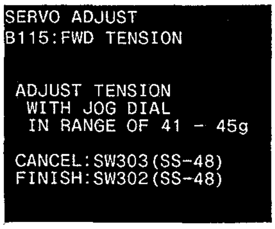
```
SERVO ADJUST
B115:FWD TENSION

 SET CASSETTE
  AND DRUM TENSION TOOL
  ON STANDBY OFF MODE.
  AND PUSH PLAY KEY
 NOT READY
*READY !
```

select with search dial

Confirm the value meets the specification.

if NG

press S302



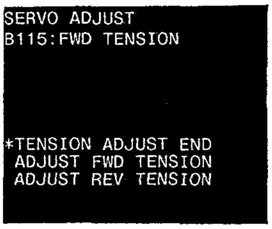
```
SERVO ADJUST
B115:FWD TENSION

 ADJUST TENSION
  WITH JOG DIAL
  IN RANGE OF 41 - 45g

 CANCEL:SW303(SS-48)
 FINISH:SW302(SS-48)
```

Rotate search dial until the value meets the specification.

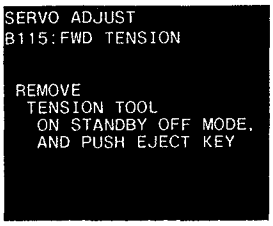
press S302

When finished, press S302

When performing REV back tension adjustment, move * mark to "ADJUST REV TENSION", and press S302.



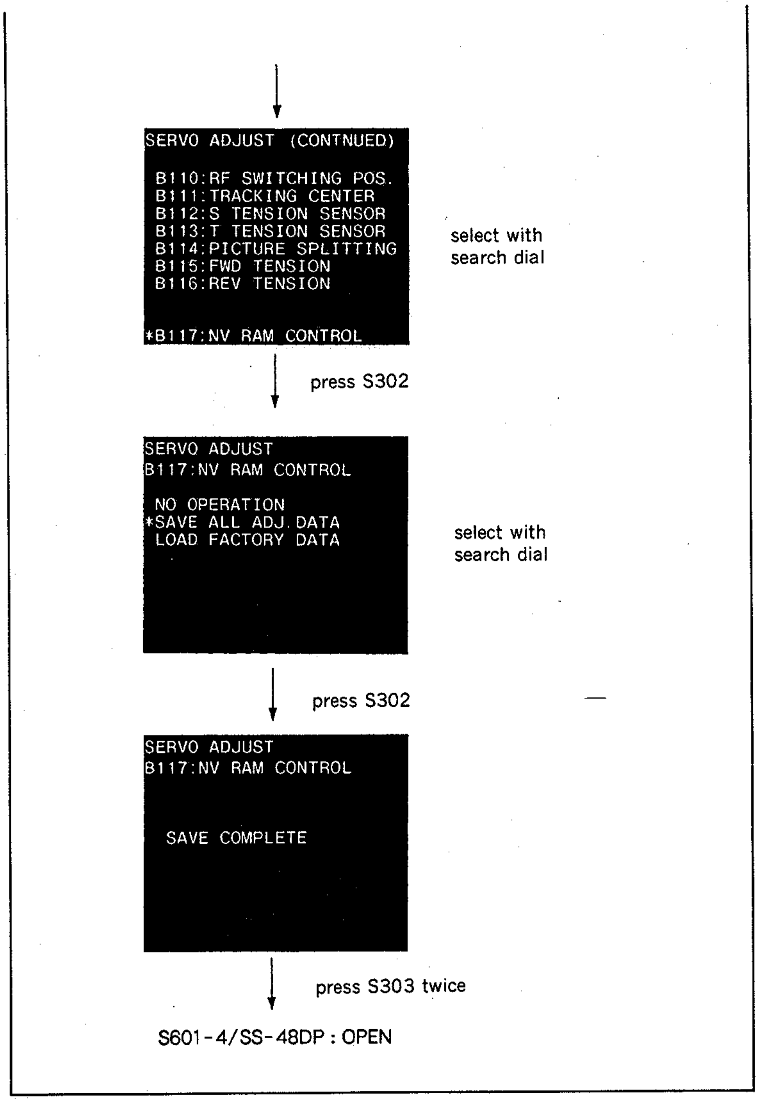
```
SERVO ADJUST
B115:FWD TENSION



*TENSION ADJUST END
 ADJUST FWD TENSION
 ADJUST REV TENSION
```



```
SERVO ADJUST
B115:FWD TENSION

 REMOVE
  TENSION TOOL
   ON STANDBY OFF MODE.
   AND PUSH EJECT KEY
```

press EJECT button

19. Move ∗ mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.
20. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
21. Move ∗ mark to "SAVE ALL ADJ. DATA" with the search dial.
22. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
23. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.
24. Turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION


*B117:NV RAM CONTROL
```

select with search dial

press S302

```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

select with search dial

press S302

```
SERVO ADJUST
B117:NV RAM CONTROL


  SAVE COMPLETE
```

press S303 twice

S601-4/SS-48DP : OPEN

4-19-4. REV Back Tension Adjustment

- Make sure to perform this adjustment with a cassette compartment is installed.

Tools

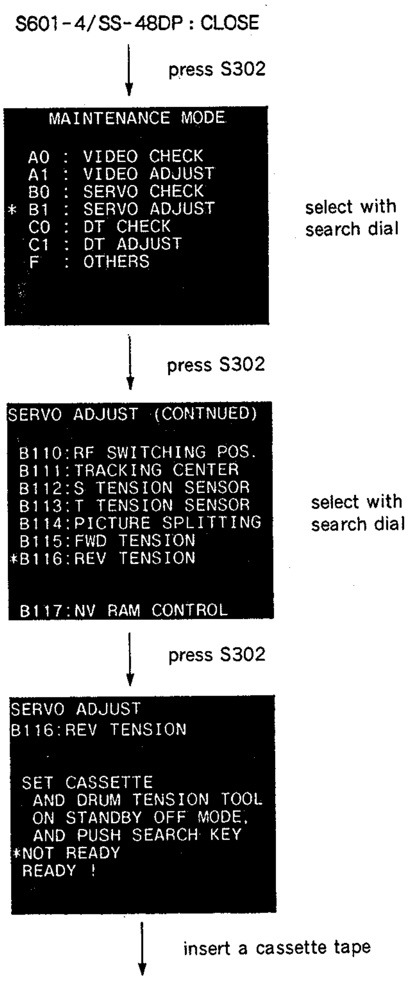
Cassette tape BCT-30M
Drum tension tool (Recommended to use TENTELOMETER U2-H7-UMC).

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

1. Put the unit into EJECT mode.
2. Turn the POWER to OFF, and put Bit4 of S601 on SS-48DP board in CLOSE state.
3. Turn the POWER to ON. Push S302 on SS-48DP board and put the unit into maintenance mode.
4. Press the search dial to enter the jog mode, and move ∗ mark to "B1 : SERVO ADJUST" which is displaying on the monitor screen with the search dial.
5. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.
6. Move ∗ mark to "B116: REV TENSION" which is displaying on the monitor screen with the search dial.
7. Press S302 on SS-48DP board to execute "REV TENSION" menu.
8. Insert a BCT-30M cassette tape at about 3 minutes portion from the tape beginning.
9. Hold a drum tension tool, and insert it into the appointed portion as shown in the figure.

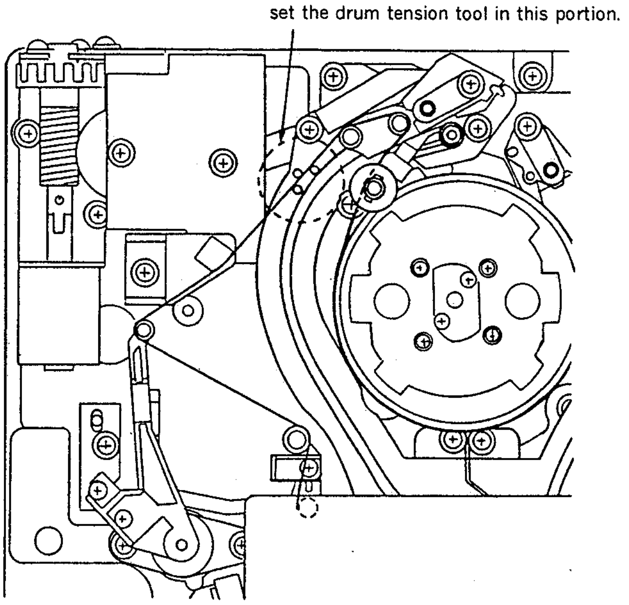


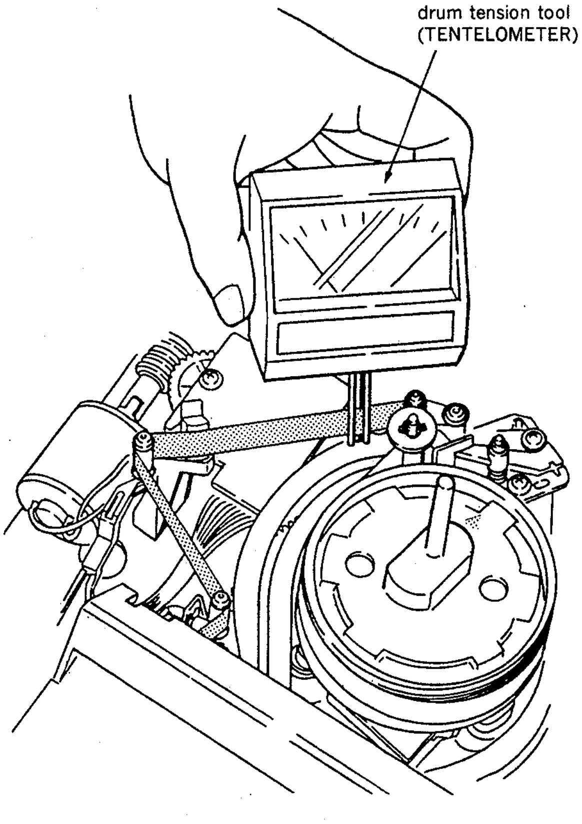
```
MAINTENANCE MODE

 A0 : VIDEO CHECK
 A1 : VIDEO ADJUST
 B0 : SERVO CHECK
* B1 : SERVO ADJUST
 C0 : DT CHECK
 C1 : DT ADJUST
 F  : OTHERS
```

```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
*B116:REV TENSION

 B117:NV RAM CONTROL
```

```
SERVO ADJUST
B116:REV TENSION

 SET CASSETTE
  AND DRUM TENSION TOOL
  ON STANDBY OFF MODE,
  AND PUSH SEARCH KEY
*NOT READY
 READY !
```

9. Hold a drum tension tool, and insert it into the appointed portion as shown in the figure.


set the drum tension tool in this portion.


drum tension tool
(TENTELOMETER)

10. Press SEARCH button.

Note : Adjust the slantness of the drum tension tool so that the tape is placed without twistng between the S tension regulator arm and full erase head, and between the full erase head and TG-2 tape guide.

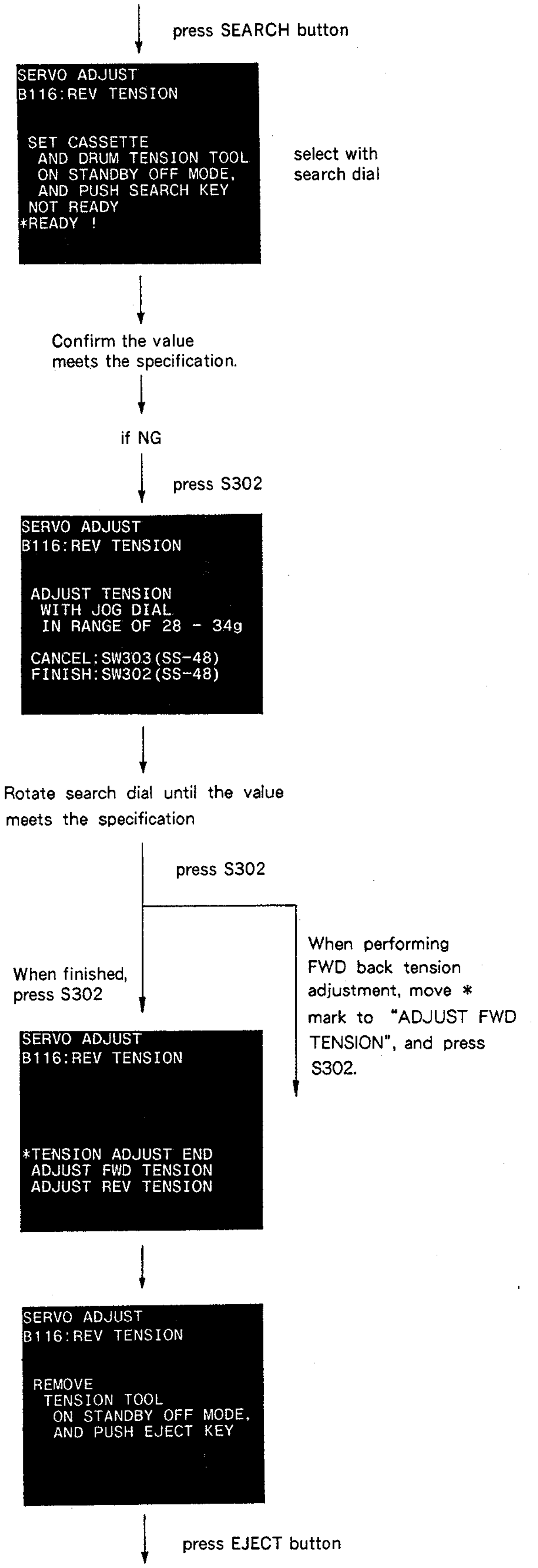
11. Move ∗ mark to "READY" which is displaying on the monitor screen with the search dial.
12. Confirm that the values of the drum tension tool satisfiy the specification.

Specification : 28 g to 34 g.

If the specificationis not satisfied, parform step ⒀ and later.

Adjustment

13. Parform steps from (1) to ⑾.
14. Press S302 on SS-48DP board.
15. Rotate search dial until the value of drum tension tool satisfies the specification.
16. If the specificationis is satisfied, press S302 on SS-48DP board.
17. When the REV back tension adjustment is finished and does not perform the FWD back tension adjustment continuously, press S302 on SS-48DP board, and perform steps (18) and later.
    If the FWD back tension adjustment performs after the REV back tension adjustment continuously, move ∗ mark to "ADJUST FWD TENSION" which is displaying on the monitor screen with the search dial, and then press S302.
    After this operation, perform the FWD back tension adjustment in accordance with Section 4-19-3.
    (The adjustment data of REV back tension adjustment and FWD back tension adjustment stores together in the NOV RAM.)
18. Remove drum tension tool and then press EJECT button, take out the cassette tape.


press SEARCH button

```
SERVO ADJUST
B116:REV TENSION

 SET CASSETTE
  AND DRUM TENSION TOOL
  ON STANDBY OFF MODE,
  AND PUSH SEARCH KEY
 NOT READY
*READY !
```

select with
search dial
Confirm the value
meets the specification.
if NG
press S302

```
SERVO ADJUST
B116:REV TENSION

 ADJUST TENSION
  WITH JOG DIAL
  IN RANGE OF 28 - 34g

 CANCEL:SW303(SS-48)
 FINISH:SW302(SS-48)
```

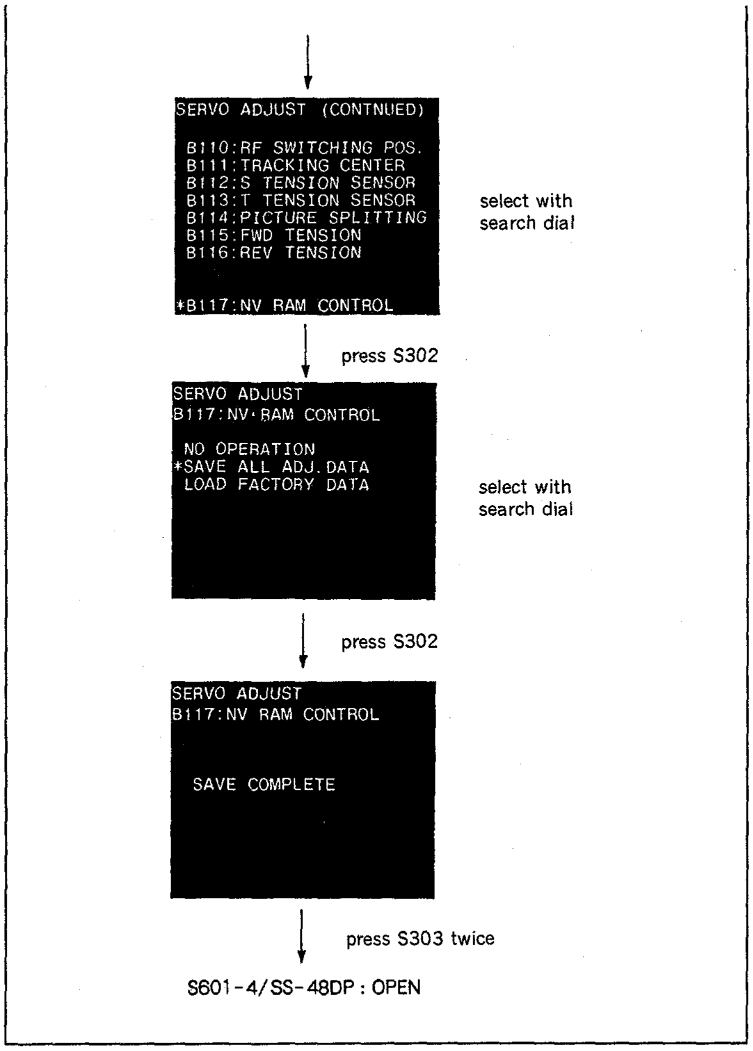
Rotate search dial until the value
meets the specification
press S302
When finished,
press S302
When performing
FWD back tension
adjustment, move ∗
mark to "ADJUST FWD
TENSION", and press
S302.

```
SERVO ADJUST
B116:REV TENSION



*TENSION ADJUST END
 ADJUST FWD TENSION
 ADJUST REV TENSION
```

```
SERVO ADJUST
B116:REV TENSION

 REMOVE
  TENSION TOOL
   ON STANDBY OFF MODE,
   AND PUSH EJECT KEY
```

press EJECT button

19. Move ＊ mark to ”B117 : NV RAM CONTROL” which is displaying on the monitor screen with the search dial.
20. Press S302 on SS-48DP board to execute ”NV RAM CONTROL” menu.
21. Move ＊ mark to ”SAVE ALL ADJ. DATA” with the search dial.
22. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
23. When ”SAVE COMPLETE” is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.
24. Turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION


*B117:NV RAM CONTROL
```

select with search dial
press S302

```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

select with search dial
press S302

```
SERVO ADJUST
B117:NV RAM CONTROL


  SAVE COMPLETE
```

press S303 twice
S601-4/SS-48DP : OPEN

4-20. T TENSION REGULATOR ARM ASSEMBLY REPLACEMENT

Tool

L shaped wrench (across flat has 0.89 mm)
: 7-700-736-06

Replacement flow chart

Replacement of T tension regulator arm assembly

Adjustment of T tension regulator arm operating position

Adjustment of T tension sensor sensitivity

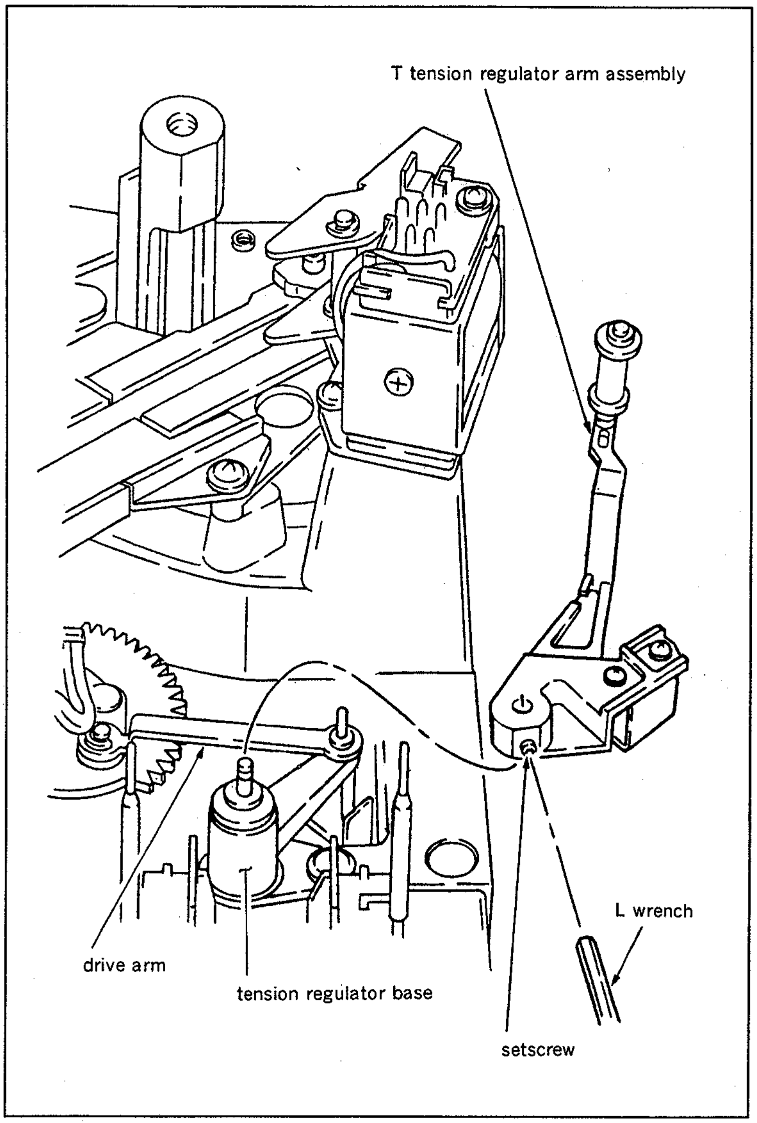
(Be sure to replace a S tension regulator arm and TR-73 board which places under the S tension regulator arm at the back side of the chassis in this step, if necessary.)

Adjustment of FWD back tension

Adjustment of REV back tension

Adjustment of tape running

Confirmation of video tracking



Removal

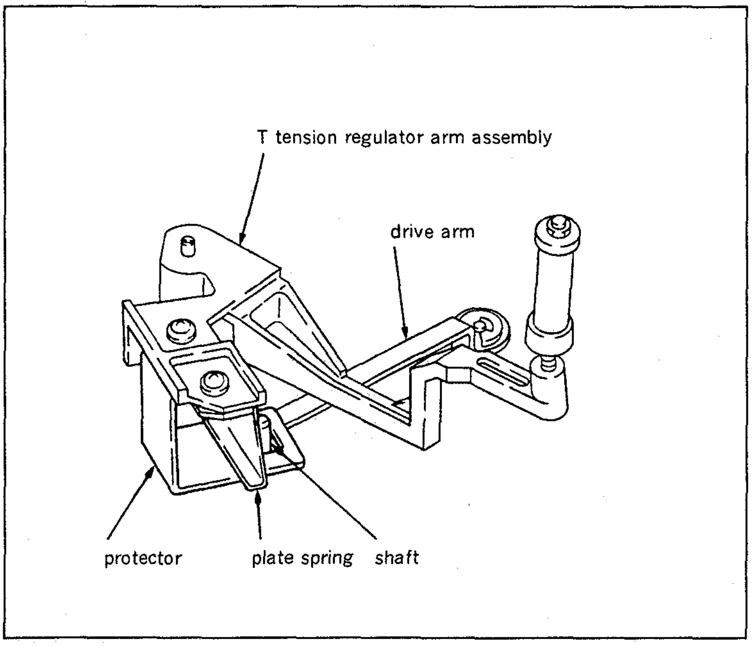
1. Turn a threading motor rotation detection ring of a threading motor block in the clockwise direction by fingers looking from thr front, and put the unit into the threading completion mode.
2. Loosen a setscrew shown in the figure holding a T tension regulator arm assembly, and lift the T tension regulator arm assembly straight up to remove.

Installation

3. Install a new T tension regulator arm assembly to a shaft of a tension regulator base so that a protector, plate spring and shaft of a drive arm are assembled as shown in the figure, and tighten a setscrew.

Adjustment after replacement

4. Perform T tension regulator arm operating position adjustment. (Refer to step ⑩ and later in Section 4-20-1.)
5. Perform T tension sensor sensitivity adjustment. (Refer to Section 4-20-2.)
6. Perform FWD back tension adjustment. (Refer to Section 4-19-3.)
7. Perform REV back tension adjustment. (Refer to Section 4-19-4.)
8. Perform tape running adjustment. (Refer to Section 5-4.)
9. Perform confirmation of video tracking. (Refer to Section 5-5.)



4-20-1. T Tension Regulator Arm Operating Position Adjustment

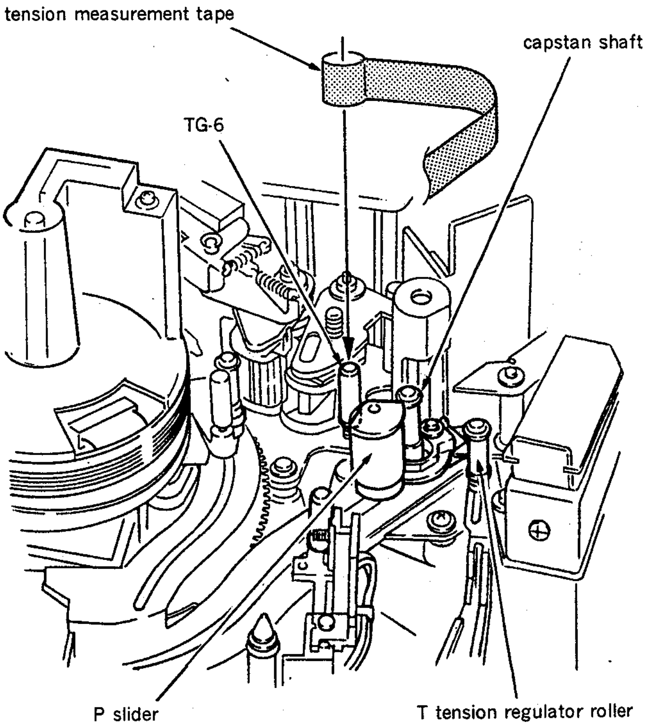
- Be sure to perform this adjustment without installing a cassette compartment.

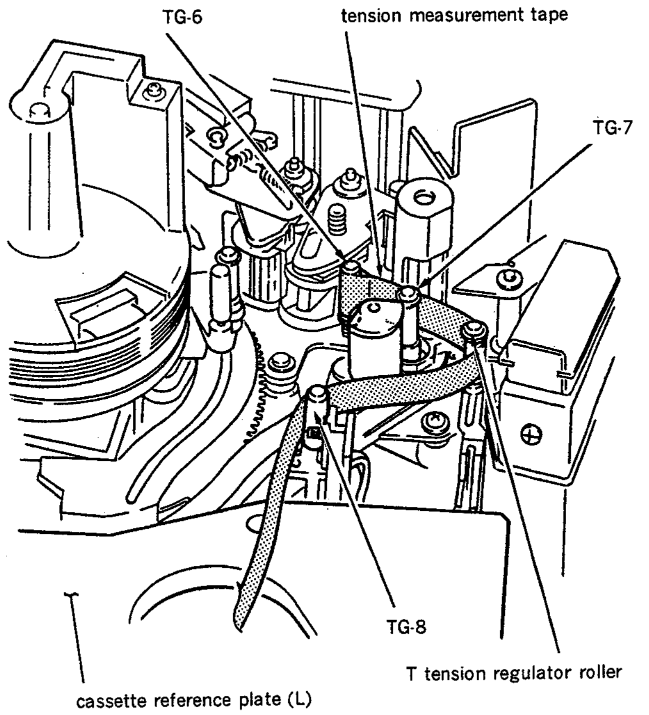
Tools

Cassette reference plate (L)	J-6320-880-A
Dial tension gauge	J-6327-850-A
Tension measurement tape	J-6327-930-A (Refer to Section 4-1.)
Nonslip rubber sheet	J-6327-980-A (Refer to Section 4-1.)
Wire clearance gauge	J-6152-450-A
Cleaning piece	2-034-697-00
Cleaning fluid	9-919-573-01

Check

1. Confirm that a reel table is in S cassette position. When it is in L cassette position, turn the POWER to ON once, change it to S cassette position, according to the Maintenance Menu "B027: REEL POSITION"
2. Turn the POWER to OFF, and place the cassette reference plate (L) on four cassette pillars.
3. Turn a threading motor rotation detection ring of a threading motor block in the clockwise direction by fingers looking it from the front, and put a P slider assmbly to 30 mm back from the threading completion mode.
4. Put one end of the tension measurement tape into TG-6 tape guide as shown in the figure.
5. Thread the tension measurement tape as shown in the figure.
6. Turn a threading motor rotation detection ring of a threading motor block in the clockwise direction by fingers looking it from the front, and put a P slider assmbly to the threading completion mode.

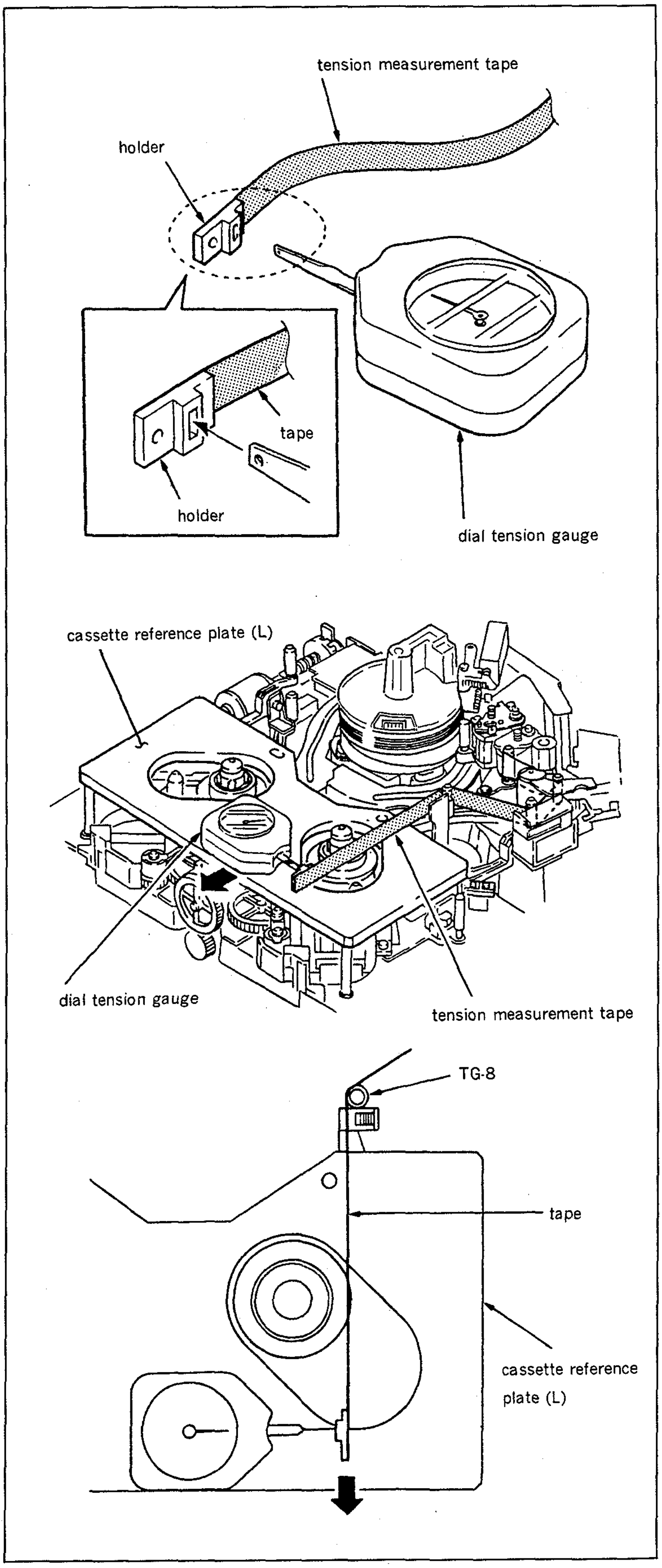

tension measurement tape
capstan shaft
TG-6
P slider
T tension regulator roller


TG-6
tension measurement tape
TG-7
TG-8
T tension regulator roller
cassette reference plate (L)

7. Put the tip of the dial tension gauge into the holder of the tension measurement tape.
8. Place the dial tension gauge on the cassette reference plate (L), and move the gauge along the cassette reference plate (L) in the direction shown in the figure until the indication of the gauge shows 20 g.

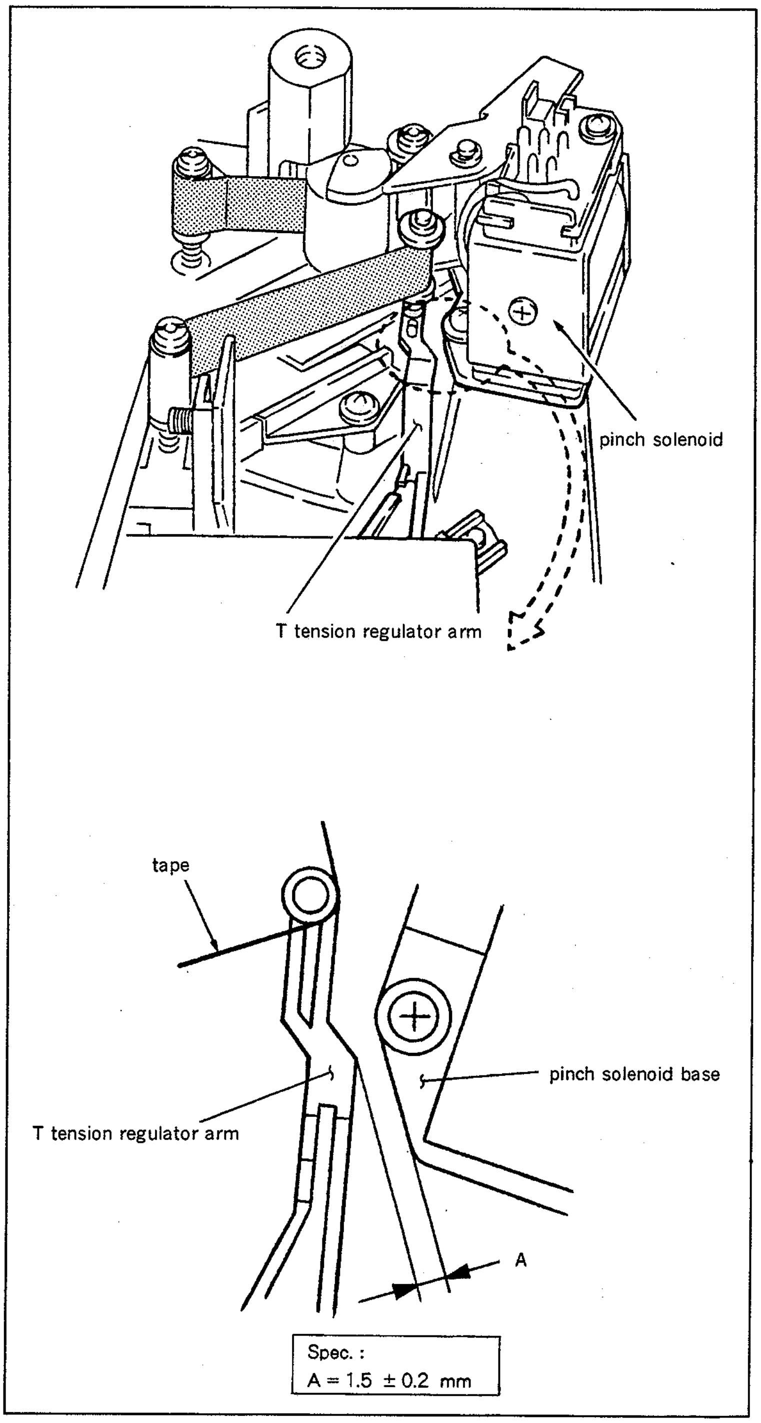
Note 1 : Confirm that the tension measurement tape is placed on every tape guide roller properly.

Note 2 : Pull the tension measurement tape in the parpendicular direction to the cassette reference plate (L).


tension measurement tape
holder
tape
holder
dial tension gauge
cassette reference plate (L)
dial tension gauge
tension measurement tape
TG-8
tape
cassette reference plate (L)

9. When the indication of the gauge is 20 g, confirm that the clearance between a T tension regulator arm and pinch solenoid base satisfy the specification as shown in the figure.

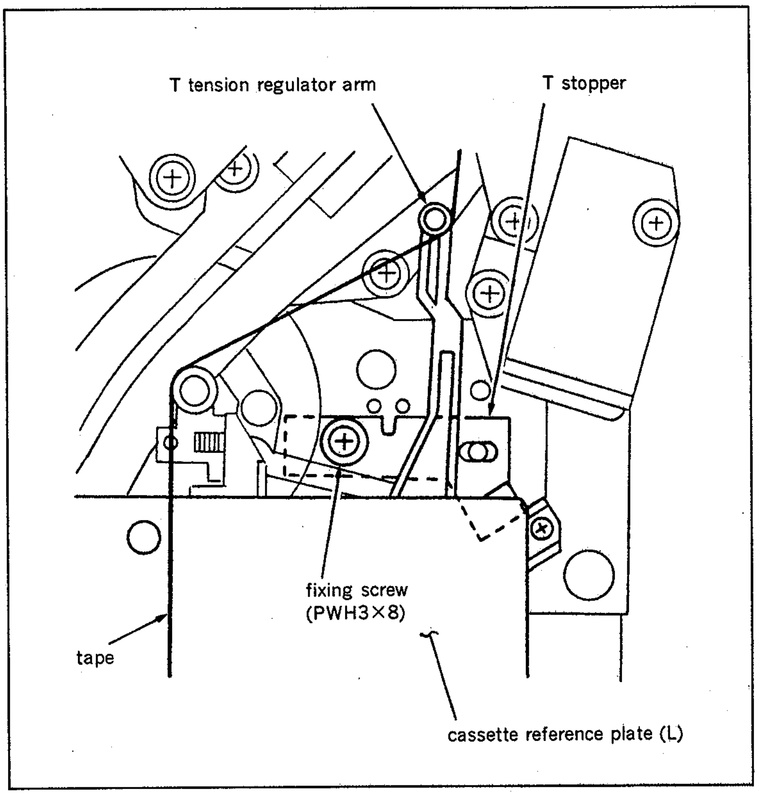
   If the specification is satisfied, perform step (15) and later.
   If the specification is not satisfied, perform step (10) and later.


pinch solenoid
T tension regulator arm
tape
pinch solenoid base
T tension regulator arm
A

Spec. :
A = 1.5 ± 0.2 mm

Adjustment

10. Loosen a fixing screw (PWH3×8) of a T stopper for 1/3 to 1/2 turn.
11. Perform step (8).
12. While keeping the state of step (8), insert a 3 mm flatblade screwdriver into notch of the T stopper, and adjust position of the T stopper so that the specification is satisfied.
13. Tighten the fixing screw (PWH3×8) of the S stopper.
14. Reconfirm that the specificatin is satisfied according to the check procedure.
15. After adjustment, turn a threading motor rotation detection ring of a threading motor block in the counterclockwise direction by fingers looking it from the front, and put the P slider assmbly to 30 mm back from the threading completion mode.
16. Take out the tension measurement tape from the unit.
17. Turn the POWER to ON, and press EJECT button to put the unit into the unthreading end mode. Take out the cassette reference plate (L).



4-20-2. T Tension Sensor Sensitivity Adjustment

- It is impossible to only confirm whether T tension sensor sensitivity is being properly adjusted. Be sure to adjust T tension sensor sensitivity as the following procedures below, and save the adjustment data in NOV RAM.
- Be sure to perform this adjustment after removing a cassette compartment.

Tool

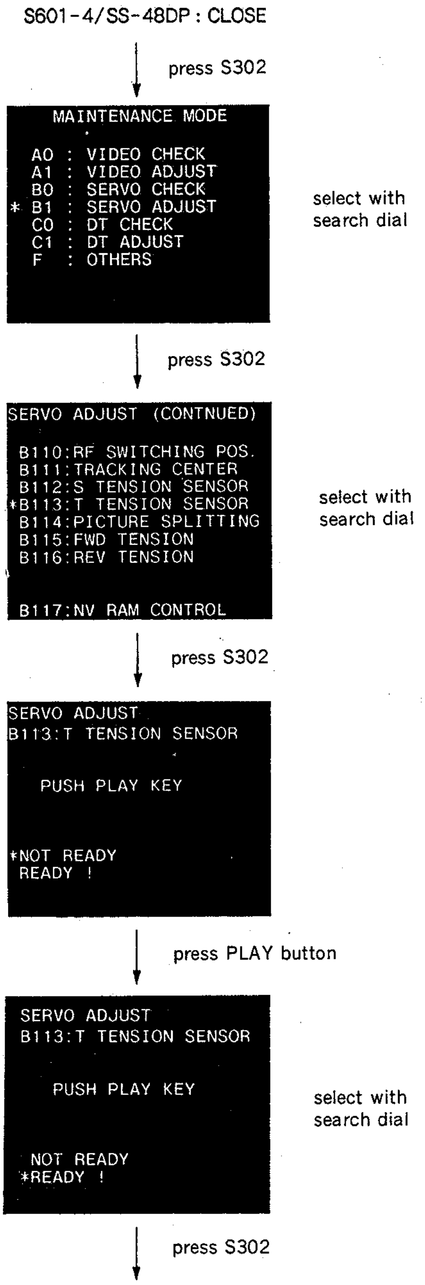
L shaped wrench (across flat has 0.89 mm)
: 7-700-736-06

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Adjustment

1. Turn the POWER to OFF, and put Bit4 of S601 on SS-48DP board in CLOSE state.
2. Turn the POWER to ON. When the POWER is turned ON, threading automatically starts. Press EJECT button to put the unit in EJECT completion mode.
3. Loosen a setscrew of a T tension regulator arm assembly for 1/4 to 1/3 turn.
4. Push S302 and put the unit into maintenance mode.
5. Press the search dial to enter the jog mode, and move ∗ mark to "B1: SERVO ADJUST" which is displaying on the monitor screen with the search dial.
6. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.
7. Move ∗ mark to "B113: T TENSION SENSOR" which is displaying on the monitor screen with the search dial.
8. Press S302 on SS-48DP board to execute "T TENSION SENSOR" menu.
9. Press PLAY button to put the unit in PLAY mode.
10. Move ∗ mark to "READY" which is displaying on the monitor screen with the search dial.
11. Press S302 on SS-48DP board.



```
MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
  B0 : SERVO CHECK
* B1 : SERVO ADJUST
  C0 : DT CHECK
  C1 : DT ADJUST
  F  : OTHERS
```

```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
*B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION

 B117:NV RAM CONTROL
```

```
SERVO ADJUST
B113:T TENSION SENSOR

  PUSH PLAY KEY


*NOT READY
 READY !
```

```
SERVO ADJUST
B113:T TENSION SENSOR

  PUSH PLAY KEY


 NOT READY
*READY !
```

12. First, use a flatblade screwdriver to rotate the adjusting screw of the T tension regulator arm assembly counterclockwise slowly until the display on the monitor screen changes (turn three to four rotation).
Then rotate the adjusting screw slowly until data displayed on the monitor screen changes to values between -10 and 10, and the data must be kept in increasing state.

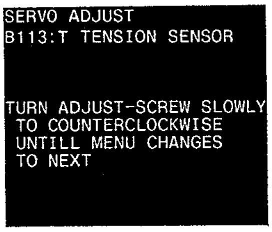
Note 1 : Make sure to rotate the flatblade screwdriver counterclockwise.

Note 2 : While adjusting screw is rotated, the data will keep on increasing and decreasing. In this adjustment, the data must be kept in increasing state and adjusted to meet the specification.
For example : 0001, 0002, 0003, 0004,... data shown in the monitor screen is increasing.
0002, 0001, 0000, -0001,...data shown in the monitor screen is decreasing.

13. Tighten a setscrew of the T tension regulator arm assembly.

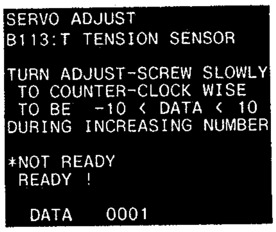
Note : Be extremely careful because of take-up reel table is rotating in high speed.

14. After tightening the setscrew, confirm that the data shown in the monitor screen remains within the range of the specification when the T tension regulator arm is moved right and left with fingers.
15. Move * mark to "READY" which is displaying on the monitor screen with the search dial.
16. Press S302 on SS-48DP board.
17. Press EJECT button to put the unit into the unthreading completion mode.



```
SERVO ADJUST
B113:T TENSION SENSOR


TURN ADJUST-SCREW SLOWLY
 TO COUNTERCLOCKWISE
 UNTILL MENU CHANGES
 TO NEXT
```

Turn adjusting screw counterclockwise direction.

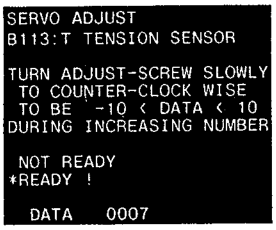


```
SERVO ADJUST
B113:T TENSION SENSOR

TURN ADJUST-SCREW SLOWLY
 TO COUNTER-CLOCK WISE
 TO BE  -10 < DATA < 10
DURING INCREASING NUMBER

*NOT READY
 READY !

  DATA    0001
```

Rotate the adjusting screw until data displayed changes to value between −10 and 10, (must be kept in increasing state).

tighten a setscrew

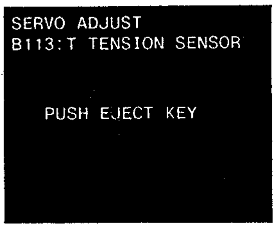
Confirm that the data remains within the range of the specification when the T tension regulator arm is moved right and left with fingers.



```
SERVO ADJUST
B113:T TENSION SENSOR

TURN ADJUST-SCREW SLOWLY
 TO COUNTER-CLOCK WISE
 TO BE  -10 < DATA < 10
DURING INCREASING NUMBER

 NOT READY
*READY !

  DATA    0007
```

select with search dial

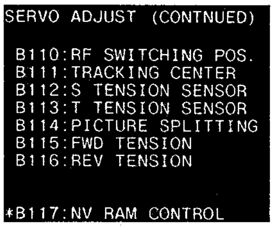
press S302



```
SERVO ADJUST
B113:T TENSION SENSOR


   PUSH EJECT KEY
```

press EJECT button

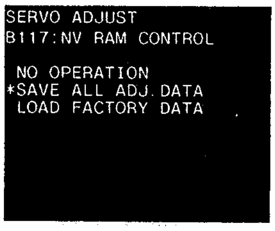
18. Press S303 on SS-48DP board to menu screen.
19. Move ∗ mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.
20. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
21. Move ∗ mark to "SAVE ALL ADJ. DATA" with the search dial.
22. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
23. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.
24. Turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION

*B117:NV RAM CONTROL
```

select with search dial

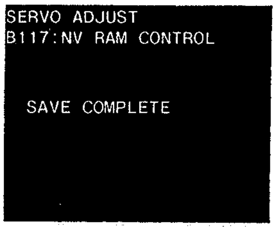
press S302



```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ. DATA
 LOAD FACTORY DATA
```

select with search dial

press S302



```
SERVO ADJUST
B117:NV RAM CONTROL


  SAVE COMPLETE
```

press S303 twice

S601-4/SS-48DP : OPEN

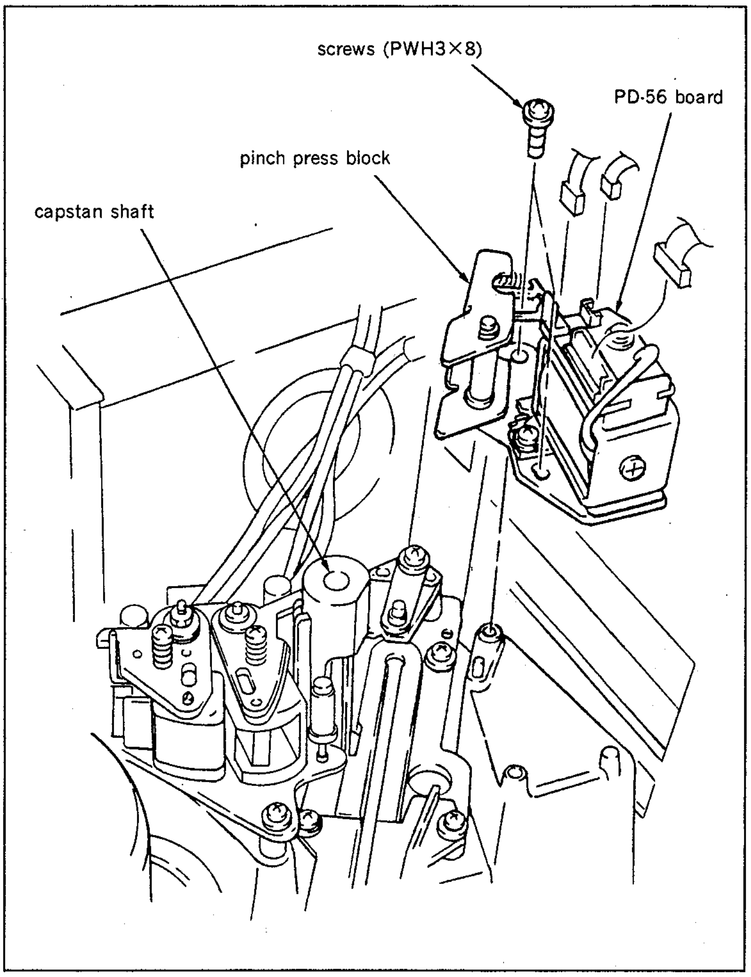
4-21. PINCH PRESS BLOCK REPLACEMENT

Replacement Flow Chart

Replacement of pinch press block

Confirmation of pinch solenold position

Confirmation of tape running



Removal

1. Put the unit into unthreading end mode.
2. Disconnect three connectors CN914, CN915 and CN916 from PD-56 board.
3. Remove two screws (PWH3×8) installing a pinch press block and remove it from the unit.

Installation

4. Install a new pinch press block with two screws (PWH3×8) to the unit.
5. Connect three connectors CN914, CN915 and CN916 to PD-56 board.

Adjustment after replacement

6. Perform confirmatiom of pinch solenoid position. (Refer to steps (1) to (9) in Section 4-22-1.)
7. Perform confirmatiom of tape running. (Refer to Sectin 5-4.)

4-22. PINCH SOLENOID REPLACEMENT

Replacement flow chart

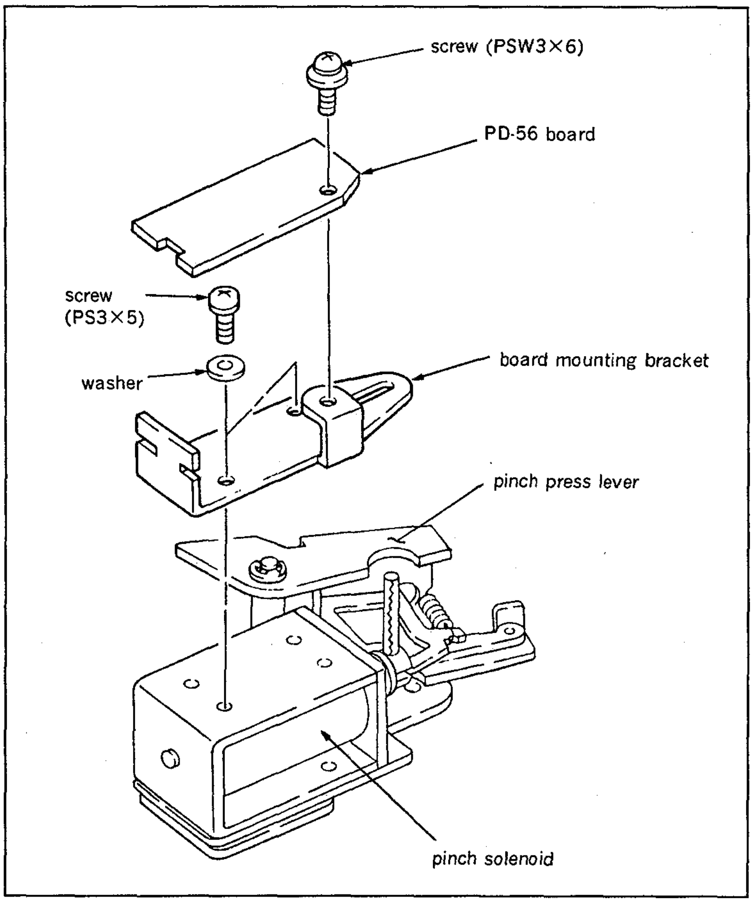
Removal of pinch press block

Replacement of pinch solenoid

Installation of pinch press block

Adjustment of pinch solenoid position

Confirmation of tape running



screw (PSW3×6)
PD-56 board
screw (PS3×5)
washer
board mounting bracket
pinch press lever
pinch solenoid

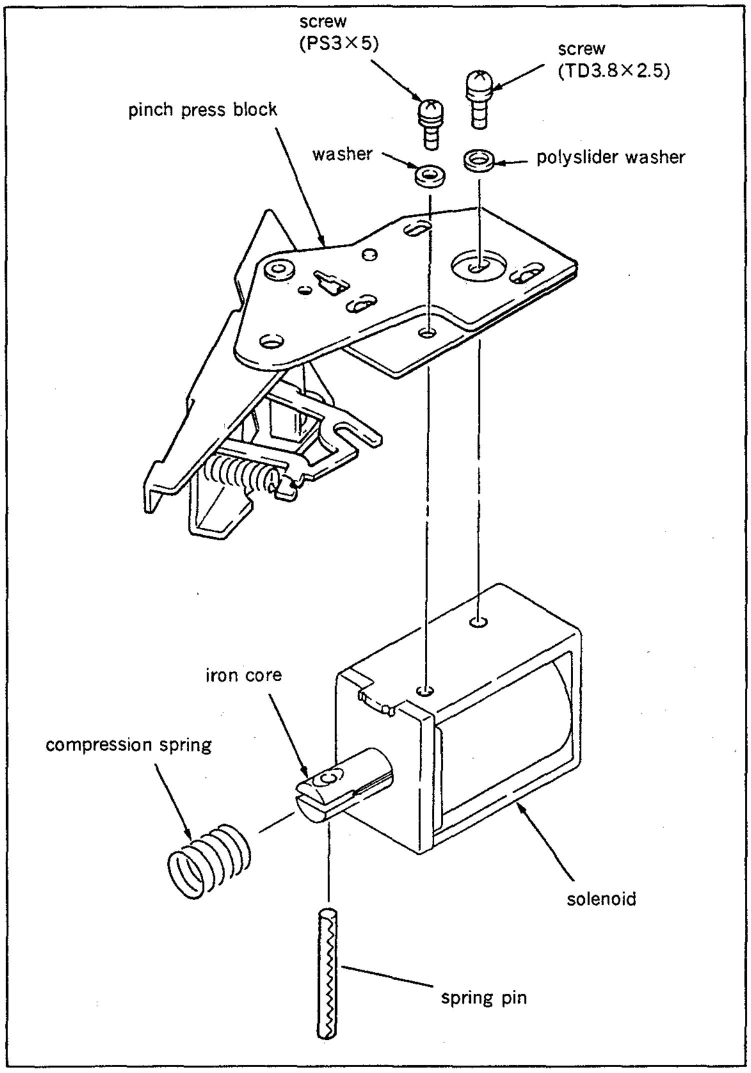
Removal

1. Put the unit into unthreading end mode.
2. Disconnect three connectors CN914, CN915 and CN916 from PD-56 board.
3. Remove two screws (PWH3×8) installing a pinch press block and remove it from the unit.
4. Remove PD-56 board and board mounting bracket.

5. Remove a spring pin from an iron core of a solenoid.

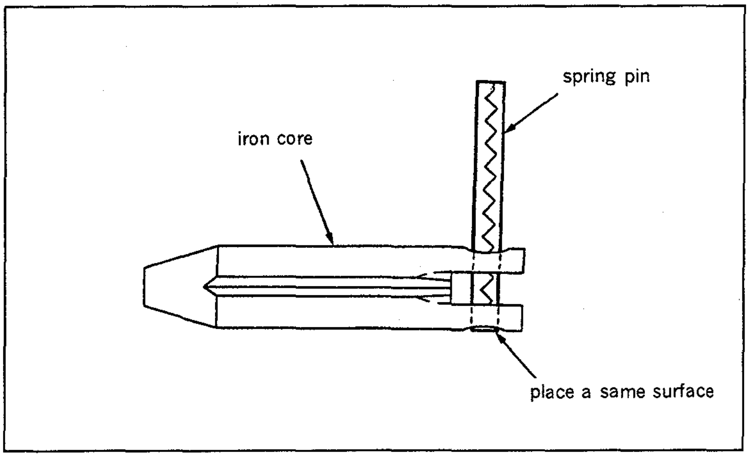
Note : A compression spring comes off at the same time. Be careful not to lose it.

6. Remove two screws (PS3×5 and TD3.8×2.5) and washer (washer and polyslider washer) shown in the figure on the botton side of the pinch press block and remove the solenoid.

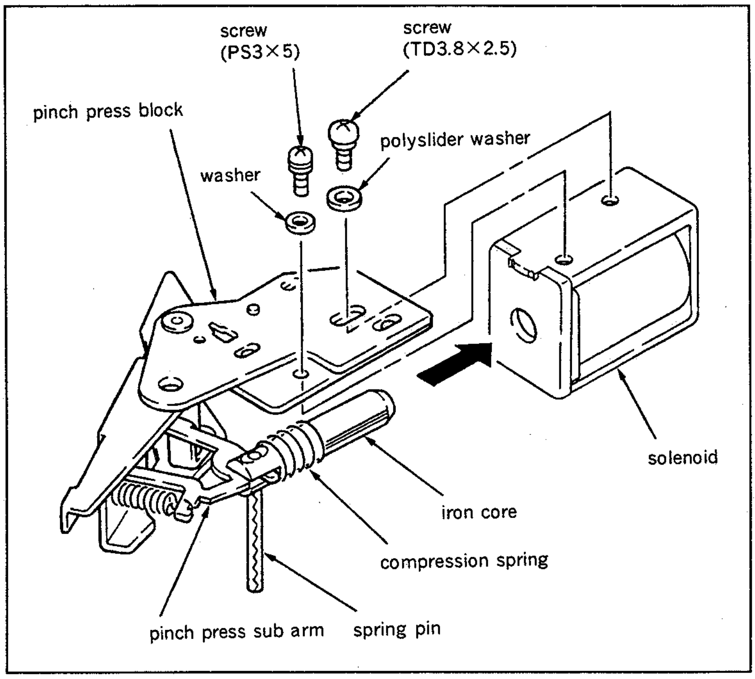

screw
(PS3×5)
screw
(TD3.8×2.5)
pinch press block
washer
polyslider washer
iron core
compression spring
solenoid
spring pin

Installation

7. Insert the spring pin into an new iron core so that the edge of the spring pin is the same positioned as outer surface of the iron core as shown in the figure.


spring pin
iron core
place a same surface

8. Insert the compression spring through longer part of the iron core as shown in the figure, and engage the groove of the pinch press sub arm with the spring pin shown in the fugure. Insert the assembled iron core into the hole of the solenoid.
9. Install the new pinch solenoid into the pinch press block with two screws (PS3×5 and TD3.8×2.5) and washers (washer and polyslider wacher).
10. After putting the spring pin through the longitudinal hole of the board mounting bracket, install the board mounting bracket with two screws (PS3×5) and washers.
11. Install PD-56 board.
12. Install the pinch press block to the unit with two screws (PWH3×8).
13. Connect CN914, CN915 and CN916 to PD-56 board.


screw
(PS3×5)
screw
(TD3.8×2.5)
pinch press block
polyslider washer
washer
solenoid
iron core
compression spring
pinch press sub arm
spring pin

Adjustment after Replacement

14. Perform pinch solenoid position adjustment. (Refer to Section 4-22-1.)
15. Perform confirmation of tape running. (Refer to Section 5-4.)

4-22-1. Pinch Solenoid Position Adjustment

- Make sure to perform this adjustment when a pinch press block and/or pinch solenoid is removed or replaced.

Tool

Wire clearance gauge : J-6152-450-A

Preparation

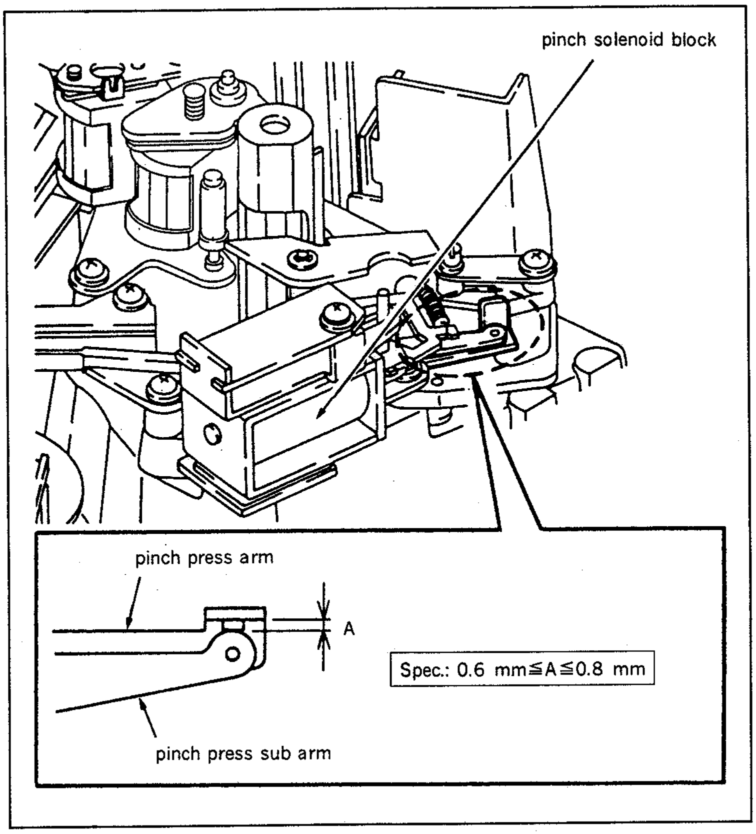
Connect a video monitor with MONITOR connector, and display characters.

Check

1. Put Bit7 of S601 on SS-48DP board in CLOSE state.
2. Turn the POWER to ON, and push S302 to put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "B0: SERVO CHECK" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVO CHECK" mode.
5. Move * mark to "B03: PLUNGER SOL. CHECK" which is displaying on the monitor screen with the search dial.
6. Press S302 on SS-48DP board to select "PLUNGER SOL. CHECK" menu.
7. Move * mark to "B031: PINCH ROLLER" which is displaying on the monitor screen with the search dial.
8. Press S302 on SS-48DP board to put the pinch solenoid into the energized state.
9. Confirm that the clearance between a pinch press arm and pinch press sub arm satisfy the specification as shown in the figure.

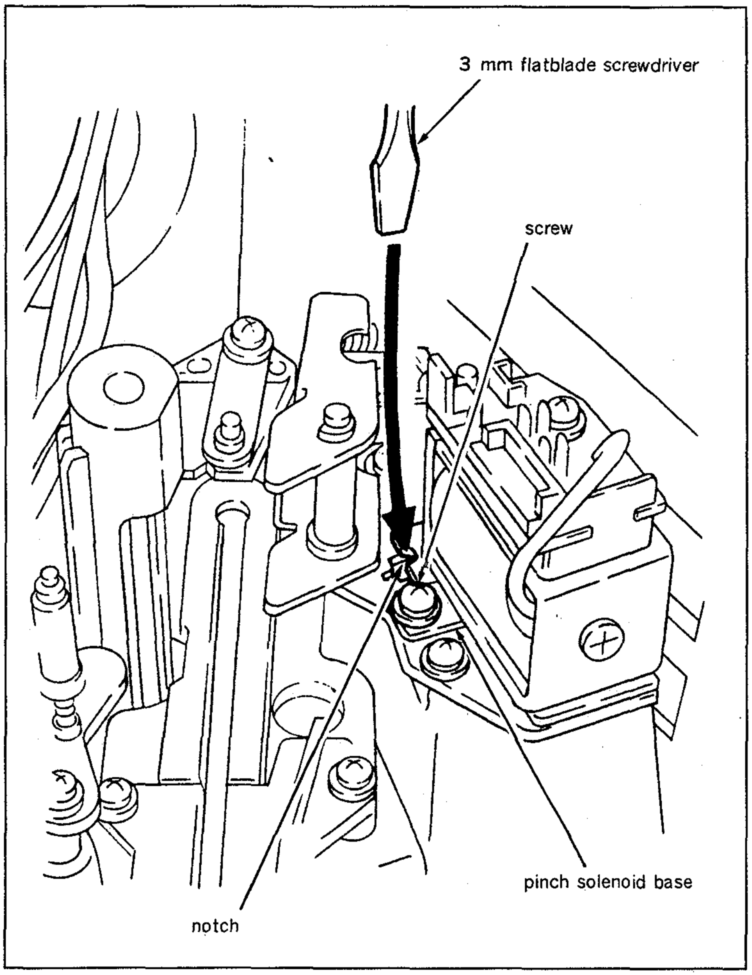
   If the specification is satisfied, perform step ⒀ and later.

   If the specification is not satisfied, perform step ⑽ and later.



Adjustment

10. Loosen a screw of the pinch solenoid base for 1/2 to 1 turn.
11. Insert a 3 mm flatblade screwdriver into the notch of the pinch solenoid base, and adjust the position of the pinch solenoid to satisfy the specification.
12. After tightening a screw, reconfirm the specification.
13. Press S302 on SS-48DP board to put the pinch solenoid into off state.
14. Press S303 twice on SS-48DP board to return to the mode screen.
15. Turn the POWER to OFF after adjustment, and put Bit7 of S601 on SS-48DP board in OPEN state.


3 mm flatblade screwdriver
screw
pinch solenoid base
notch

4-23. THREADING RING REPLACEMENT

- It is quite rare to replace a threading ring. In case the replacement is necessary, be extremely careful with the gear engagement adjustment of the threading ring and threading gear described in step ⑬.
- If the adjustment is not done correctly, tape can't thread in the correct position.

Tools

Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
Cassetle tape BCT-20M

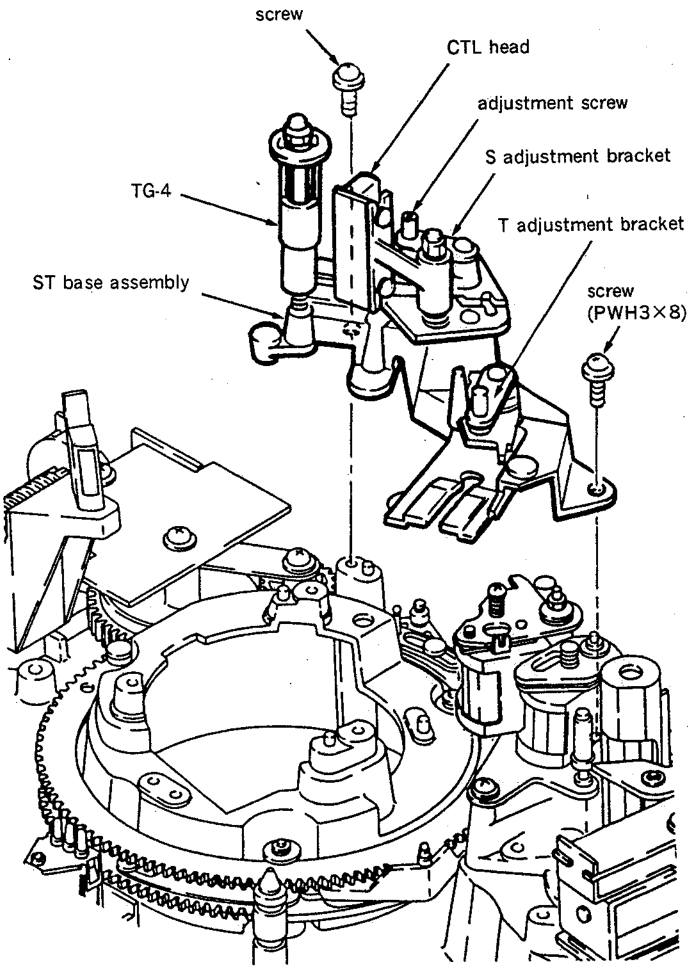
Replacement flow chart

- Removal of cleaning roller block
- Removal of AU head cover
- Removal of S rail and S slider assembly
Removal of T rail and T slider assembly
Removal of P slider assembly
- Removal of ST base assembly
- Replacement of threading ring
- Installation of ST base assembly
- Installation of S rail and S slider assembly
Installation of T rail and T slider assembly
Installation of P slider assembly
- Installation of AU head cover
- Installation of cleaning roller block
- Adjustment of cleaning roller block position
- Adjustment of tape running
- Adjustment of video tracking
- Adjustment of CTL head height
- Adjustment of CTL position
- Adjustment of audio head height
- Adjustment of audio head phase
- Adjustment of confidence head height
- Adjustment of confidence head phase
- Confirmation of tape running
- Adjustment of TC head position

Removal

1. Remove a cleaning roller block.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover. At this time, the harness clamper of the drum comes off together. (Refer to step (3) in Section 5-3.)
3. Place a reel table to the L cassette position.
4. Remove a S rail and S slider assembly.
   (Refer to steps (1) to (6) in Section 4-16.)
5. Remove a T rail and T slider assembly.
   (Refer to steps (5) to (10) in Section 4-17.)
6. Remove a P slider assembly. (Refer to steps (7) and (8) in Section 4-18.)
7. Disconnect connectors from a drum which are connected to RP board.
8. Remove two screws (PWH3×8) of a ST base assembly, and place it on the power block.

Note : Be careful not to loose or tighten the adjustment screws of a S adjustment bracket and T adjustment bracket, and also not to change height of a CTL head and TG-4 tape guide on the ST base assembly.
It is recomended to cover the CTL head with gauze to prevent make damage of tape running surface of the CTL head.


screw
CTL head
adjustment screw
S adjustment bracket
TG-4
T adjustment bracket
ST base assembly
screw
(PWH3×8)

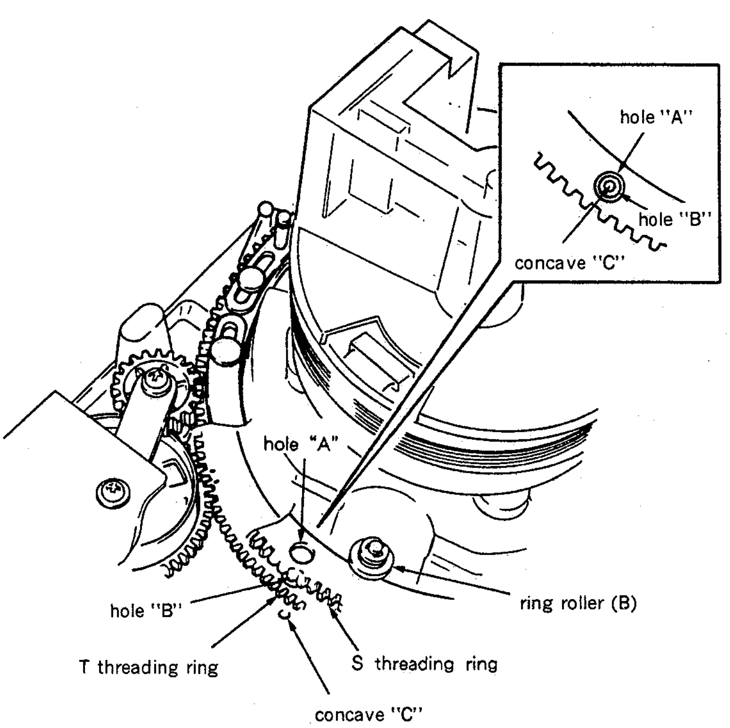
〈Drum assembly is omitted in this illustration.〉

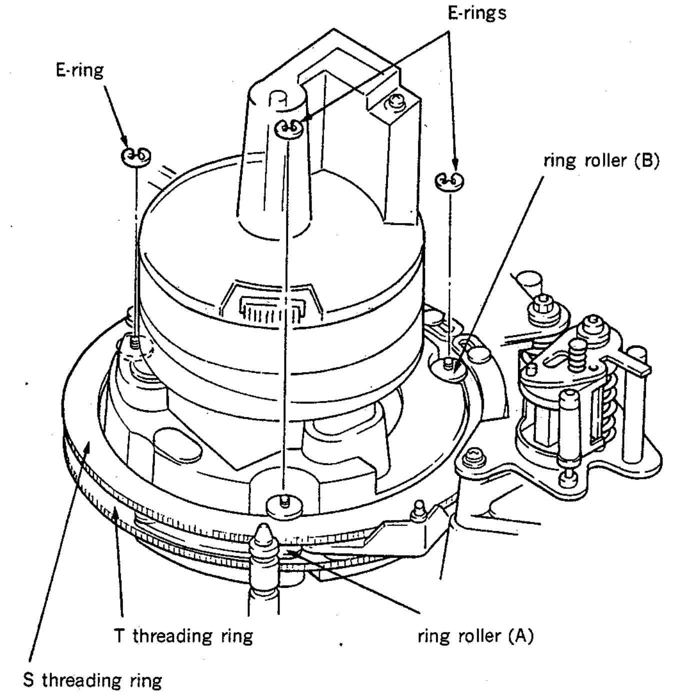
9. Turn a threading motor rotation detection ring of a threading motor block by fingers looking it from the front so that match hole "A" of a S threading ring, hole "B" of a T threading ring and in the concave "C" on the slant chassis.

Note 1 : This operation is the important point when installing a new threading ring.

Note 2 : Be extremely careful not to move the threading gear of the threading gear block when performing following step (13).

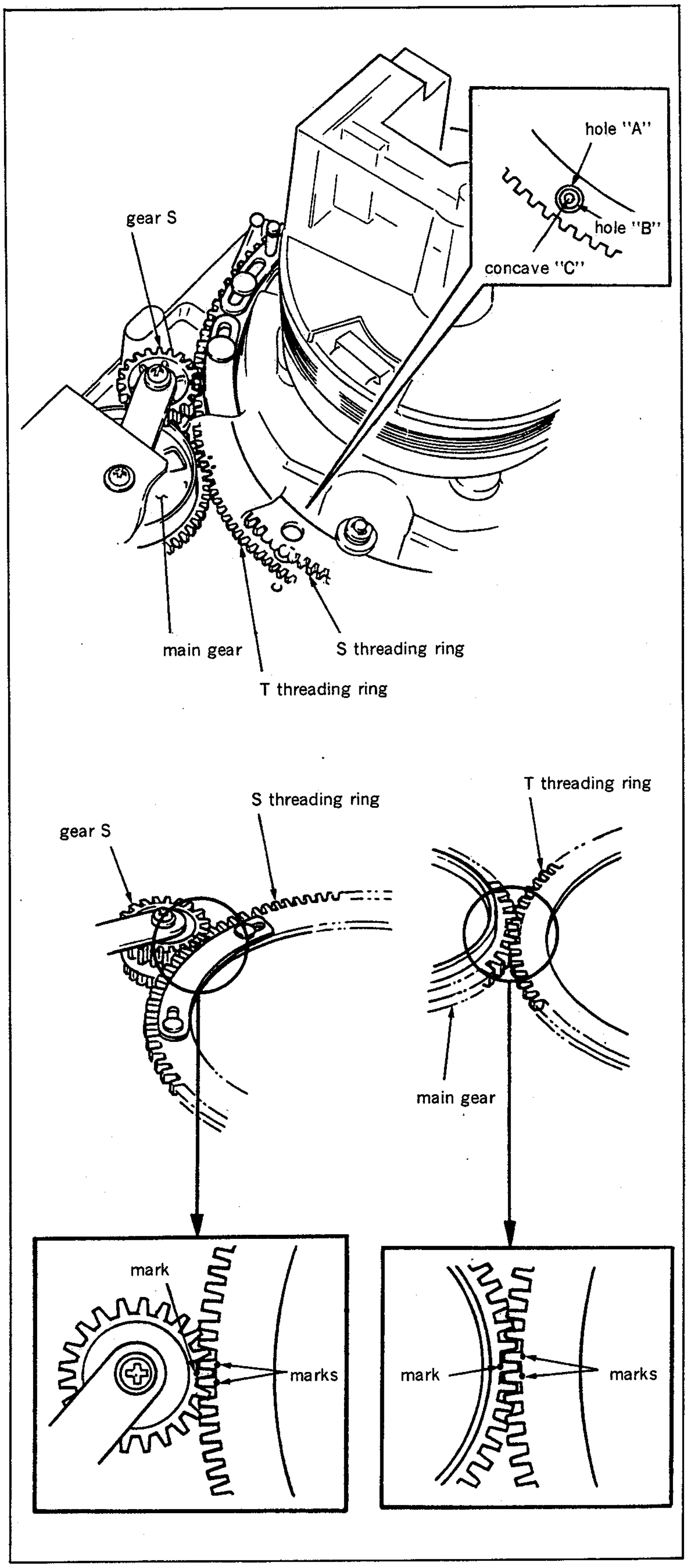
10. Remove three E-rings on the upper part of a ring roller holding the threading ring.
11. When three ring roller (B)s are removed, then the S threading ring can be removed, and three ring roller (A)s are removed, the T threading ring can be removed.


hole "A"
hole "B"
concave "C"
hole "A"
ring roller (B)
hole "B"
T threading ring
S threading ring
concave "C"


E-rings
E-ring
ring roller (B)
T threading ring
ring roller (A)
S threading ring

Installation

12. Clean the inside of a new threading ring to be replaced with the cleaning piece moistened with cleaning fluid.
13. Install the T threading ring so that engage two marks on the teeth of the T threading ring with a mark on the tooth of the main gear as shown in the figure. Then insert the ring roller (A).
    Install the S threading ring so that engage two marks on the teeth of the S threading ring with a mark on the tooth of the gear S as shown in the figure. Then install the ring roller (B). Make sure that the hole "A" of the S threading ring, hole "B" of the T threading ring and in the concave "C" on the slant chassis are the same position.
14. Install three E-rings to each point on the shaft of the ring roller.
15. Make sure that the threading ring rotates smoothly, when turning the threading motor rotation detection ring of a threading motor block by fingers.
16. Turn the threading motor rotation detection ring of a threading motor block with finger, and place the threading ring to the point of 5 mm back from the threading completion mode.
17. Assemble the ST base assembly, P slider assembly, T slider assembly, T rail, S slider assembly and T rail in the reversing the order of steps (4) to (8).
18. Turn the POWER to ON, make sure that the threading operates properly and smoothly.
19. Insert a casette tape, and make sure that the tape threads to the normal position.



Adjustment after replacement

20. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)
21. Perform tape running adjustment. (Refer to Section 5-4.)
22. Perform video tracking adjustment. (Refer to Section 5-5.)
23. Perform CTL head height adjustment. (Refer to Section 5-6.)
24. Perform CTL head position adjustment. (Refer to Section 5-7.)
25. Perform audio head height adjustment. (Refer to Section 5-8.)
26. Perform audio head phase adjustment. (Refer to Section 5-9.)
27. Perform confidence head height adjustment. (Refer to Section 5-11.)
28. Perform confidence head phase adjustment. (Refer to Section 5-12.)
29. Perform confirmation of tape running. (Refer to Section 5-4.)
30. Perform TC head position adjustment. (Refer to Section 5-14.)

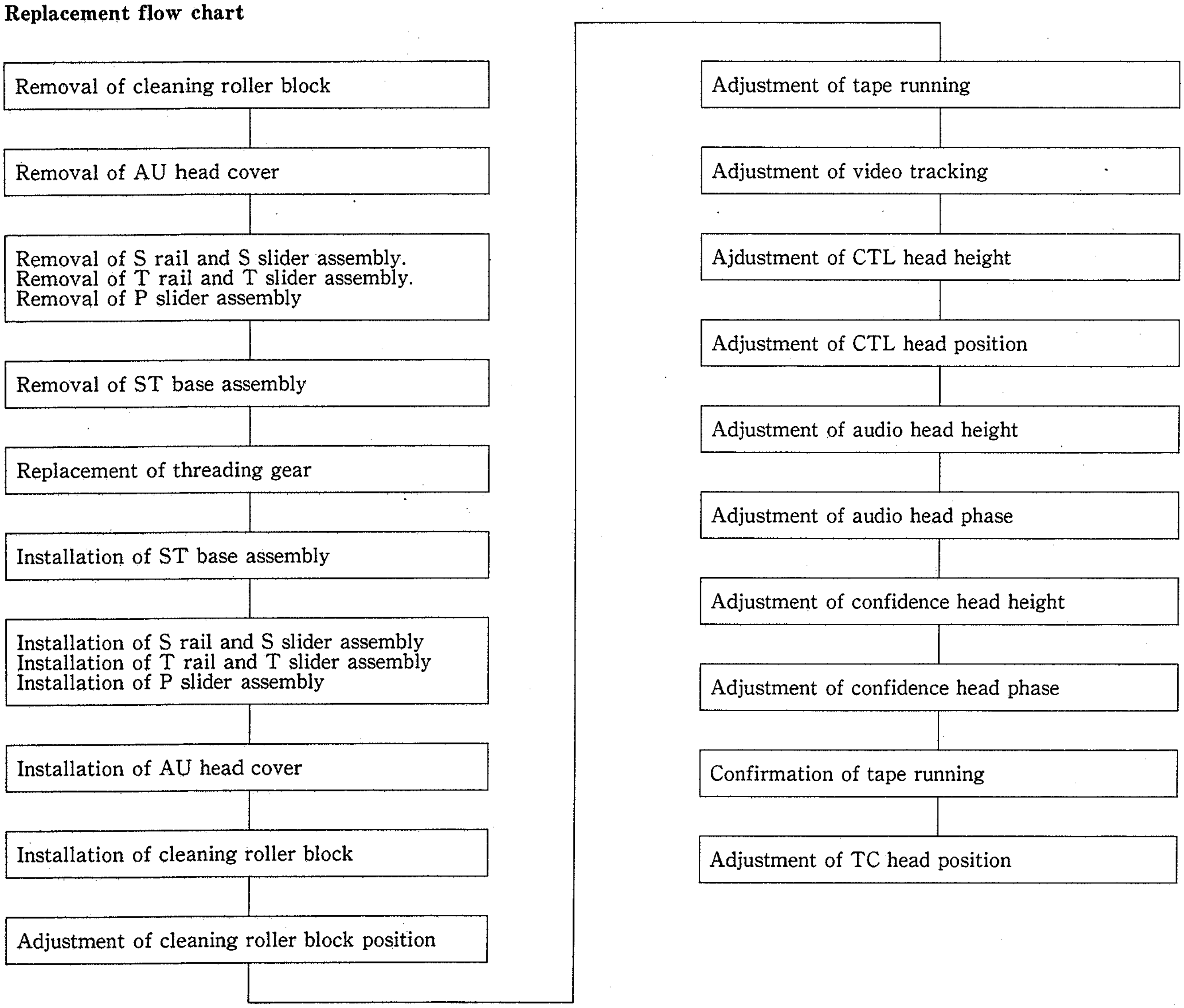
4-24. THREADING GEAR REPLACEMENT

- When a threading gear is replaced, be extremely careful with the gear engagement adjustment of the threading ring and threading gear.
- If this adjustment is not done correctly, tape can't thread in the correct position.

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Cassette tape (BCT 20M)	

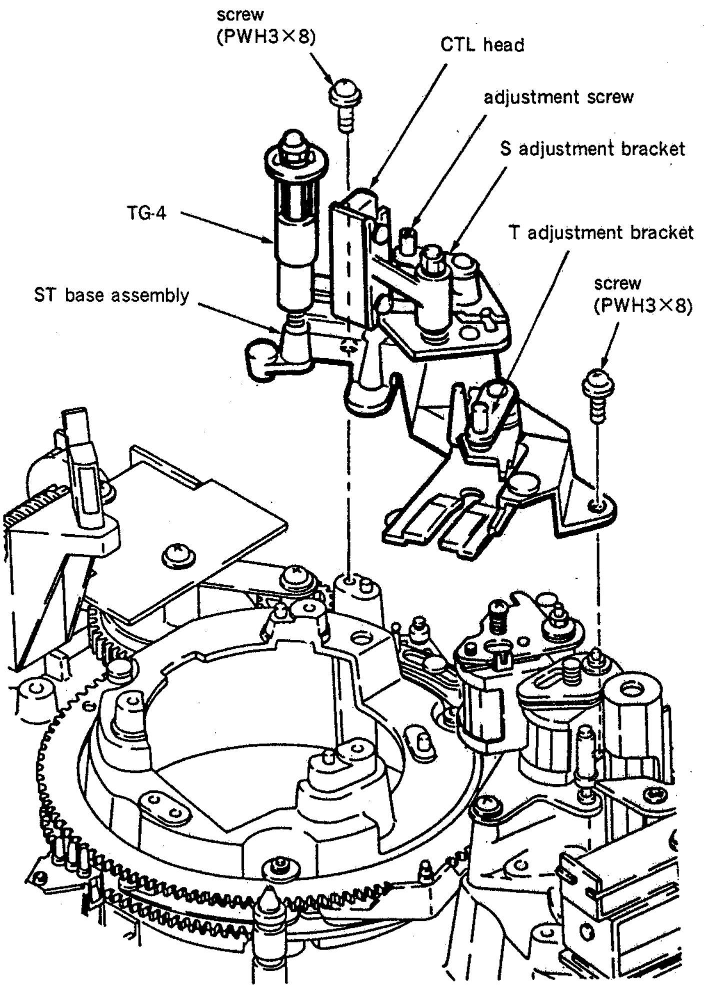
Replacement flow chart


Removal of cleaning roller block
Removal of AU head cover
Removal of S rail and S slider assembly.
Removal of T rail and T slider assembly.
Removal of P slider assembly
Removal of ST base assembly
Replacement of threading gear
Installation of ST base assembly
Installation of S rail and S slider assembly
Installation of T rail and T slider assembly
Installation of P slider assembly
Installation of AU head cover
Installation of cleaning roller block
Adjustment of cleaning roller block position
Adjustment of tape running
Adjustment of video tracking
Ajdustment of CTL head height
Adjustment of CTL head position
Adjustment of audio head height
Adjustment of audio head phase
Adjustment of confidence head height
Adjustment of confidence head phase
Confirmation of tape running
Adjustment of TC head position

Removal

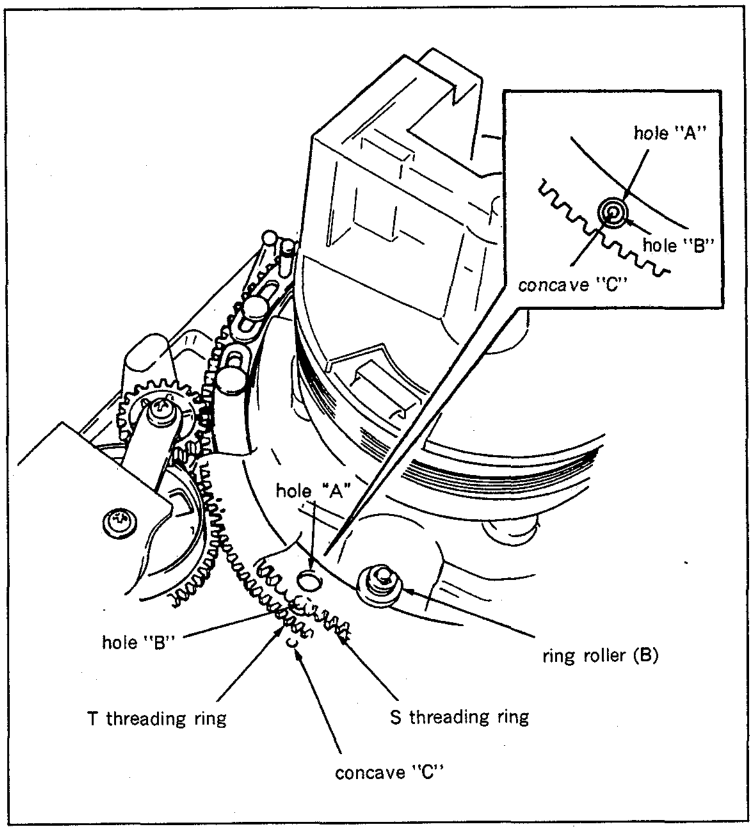
1. Remove a cleaning roller block. (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover. At this time, the harness clamper of the drum comes off together. (Refer to step (3) in Section 4-3.)
3. Place a reel table to the L cassette position.
4. Remove a S rail and S slider assembly. (Refer to steps (1) to (6) in Section 4-16.)
5. Remove a T rail and T slider assembly. (Refer to steps (5) to ⑽ in Section 4-17.)
6. Remove a P slider assembly. (Refer to steps (7) and (8) in Section 4-18.)
7. Disconnect connectors from a drum which are connected to RP board.
8. Remove two screws (PWH3×8) of a ST base assembly, and place it on the power block.

Note : Be careful not to loose or tighten the adjustment screws of a S adjustment bracket and T adjustment bracket, and also not to change height of a CTL head and TG-4 tape guide on the ST base assembly.
It is recomended to cover the CTL head with gauze to prevent make damage of tape running surface of the CTL head.

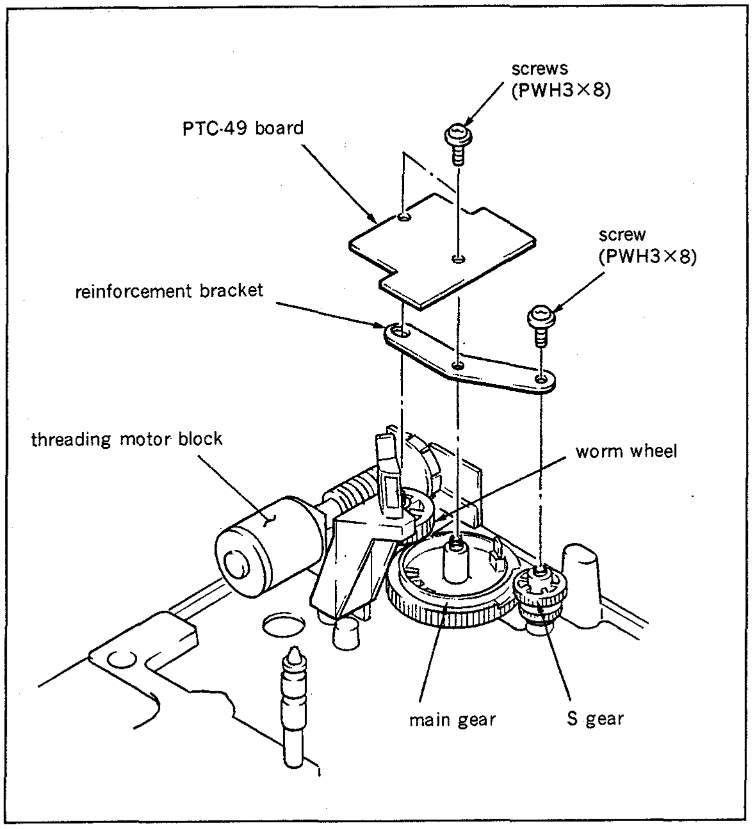

screw
(PWH3×8)
CTL head
adjustment screw
S adjustment bracket
TG-4
T adjustment bracket
ST base assembly
screw
(PWH3×8)

<Drum assembly is omitted in this illustration.>

9. Turn a threading motor rotation detection ring of a threading motor block by fingers looking it from the front so that match hole "A" of a S threading ring, hole "B" of a T threading ring and in the concave "C" on the slant chassis.


hole "A"
hole "B"
concave "C"
hole "A"
hole "B"
ring roller (B)
T threading ring
S threading ring
concave "C"

10. Disconnect connectors CN901, CN902 and CN903 from PTC-49 board. Remove two screws (PWH3×8) of PTC-49 board and remove it from the unit.
11. Remove a screw (PWH3×8) of a reinforcement bracket, and remove it.
12. Remove a worm wheel, S gear and main gear from the unit.

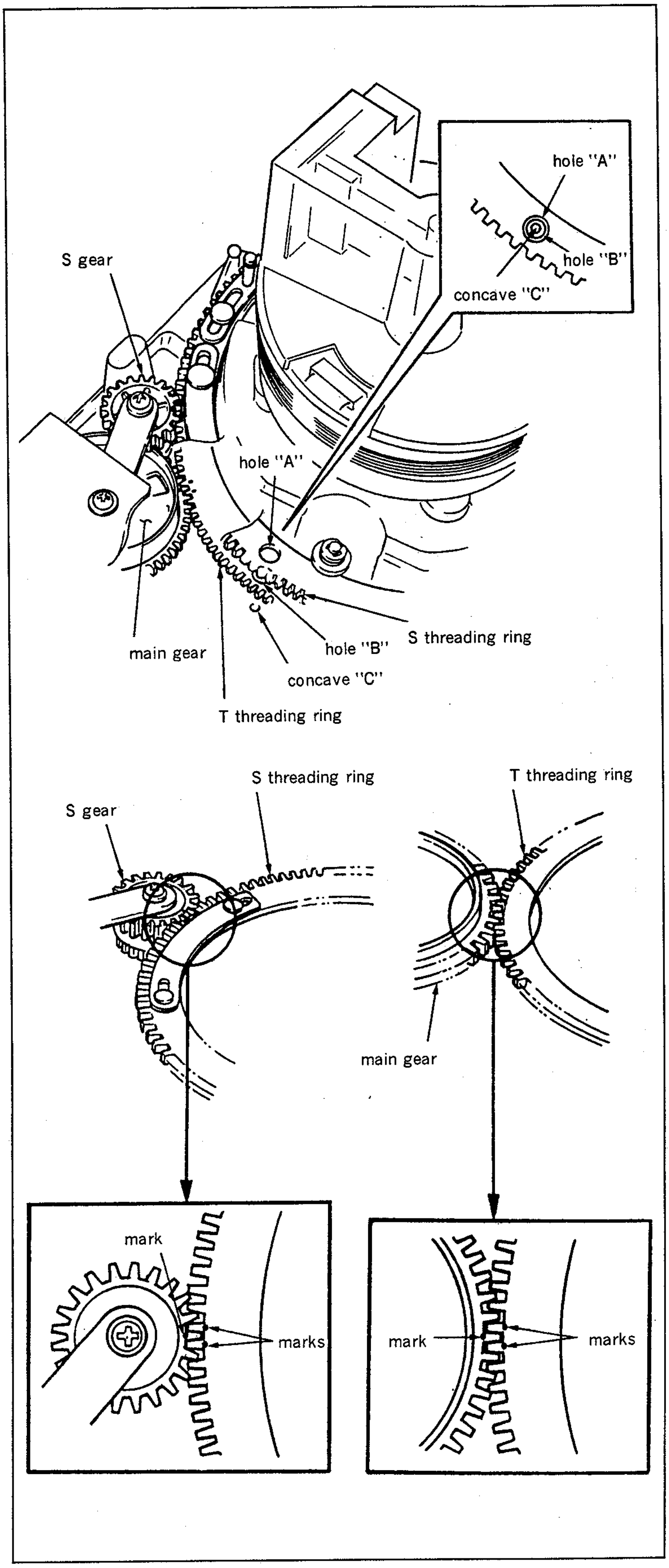

screws
(PWH3×8)
PTC-49 board
screw
(PWH3×8)
reinforcement bracket
threading motor block
worm wheel
main gear
S gear

Installation

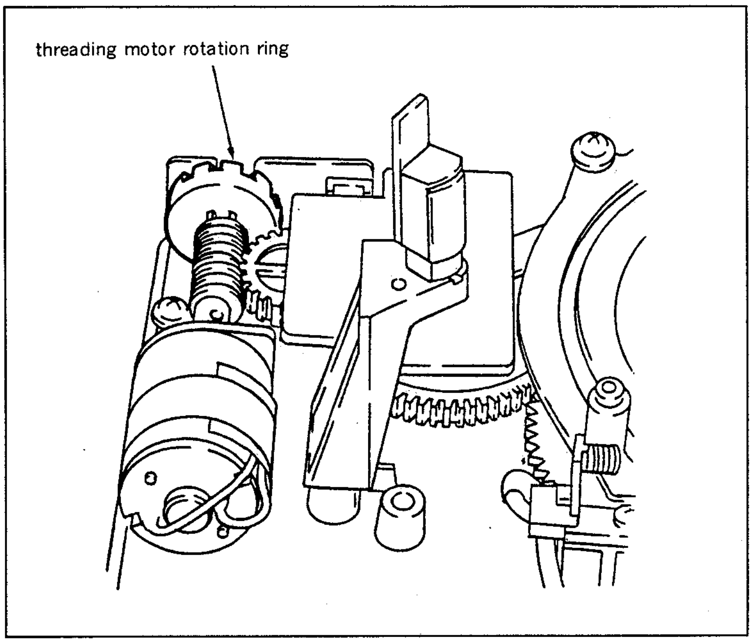
Note 1 : Install the worm wheel and S gear after performing following step (14) main gear engagement adjustment.

Note 2 : When install the S gear, perform following step (15) S gear engagement adjustment.

13. Clean installation shaft for the gear, and hole of the gear with cleaning piece moistened with cleaning fluid.
14. Install the main gear and perform the main gear engagement adjustment.
    (1)Make sure that the hole "A" of the S threading ring, hole "B" of the T threading ring and in the concave "C" on the slant chassis are the same position.
    (2)Install the main gear so that engage two marks on the teeth of the T threading ring with a mark on the tooth of the main gear as shown in the figure.
15. Install the S gear and perform the S gear engagement adjustment.
    (1)Make sure that the hole "A" of the S threading ring, hole "B" of the T threading ring and in the concave "C" on the slant chassis are the same position.
    (2)Install the S gear so that engage two marks on the teeth of the S threading ring with a mark on the tooth of the S gear as shown in the figure.
16. Install the worm wheel.
17. Install the reinforcement bracket.
18. Connect connectors CN901, CN902 and CN903 to PTC-49 board, and install PTC-49 board to the unit.


hole "A"
hole "B"
concave "C"
S gear
hole "A"
main gear
hole "B"
S threading ring
concave "C"
T threading ring
S threading ring
T threading ring
S gear
main gear
mark
marks
mark
marks

19. Turn the threading motor rotation detection ring of a threading motor block with finger, and place the threading ring to the point of 5 mm back from the threading completion mode.
20. Assemble the ST base assembly, P slider assembly, T slider assembly, T rail, S slider assembly and T rail in the reversing the order of steps (4) to (8).
21. Turn the POWER to ON, make sure that the threading operates properly and smoothly.
22. Insert a cassette tape, and make sure that the tape threads to the normal position.



Adjustment after replacement

23. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)
24. Perform tape running adjustment. (Refer to Section 5-4.)
25. Perform video tracking adjustment. (Refer to Section 5-5.)
26. Perform CTL head height adjustment. (Refer to Section 5-6.)
27. Perform CTL head position adjustment. (Refer to Section 5-7.)
28. Perform audio head height adjustment. (Refer to Section 5-8.)
29. Perform audio head phase adjustment. (Refer to Section 5-9.)
30. Perform confidence head height adjustment. (Refer to Section 5-11.)
31. Perform confidence head phase adjustment. (Refer to Section 5-12.)
32. Perform confirmation of tape running. (Refer to Section 5-4.)
33. Perform TC head position adjustment. (Refer to Section 5-14.)

4-25. CTL HEAD REPLACEMENT

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01

Replacement flow chart

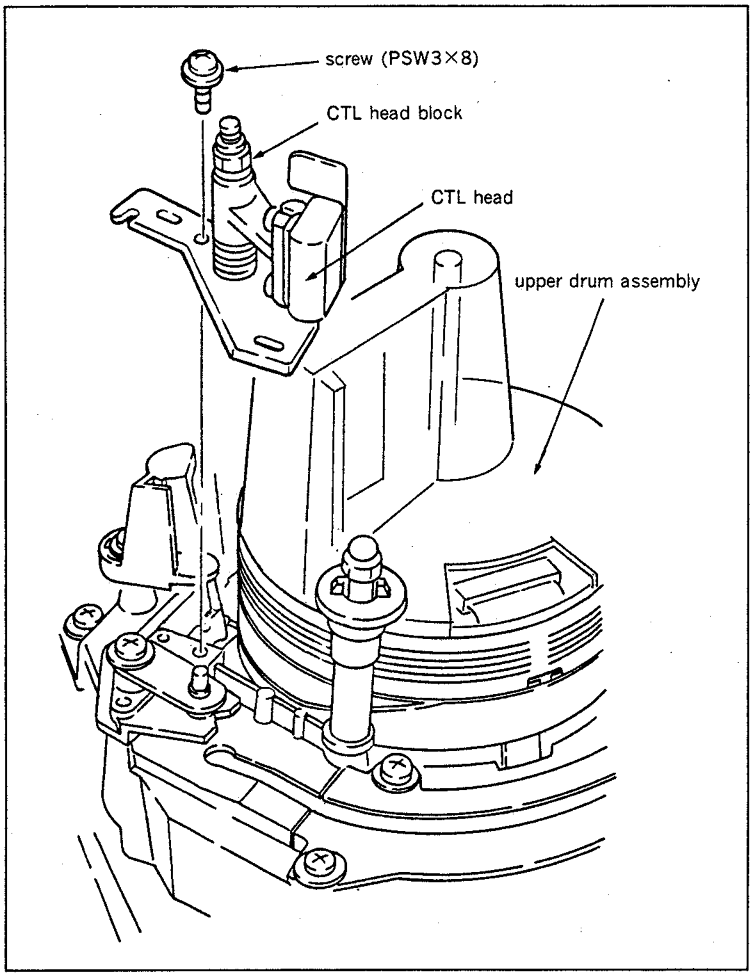
Replacement of CTL head

Adjustment of video tracking

Adjustment of CTL head height

Adjustment of CTL head position

Adjustment of TC head position

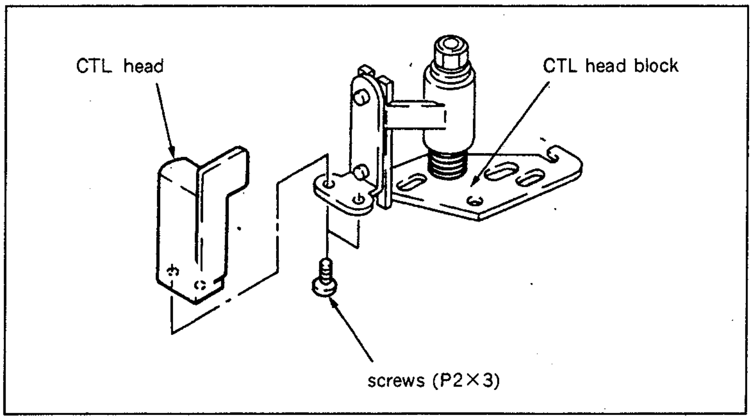


Removal

1. Rotate an upper drum assembly by hand, and set the video heads away from a CTL head.
2. Unsolder two lead wires from the CTL head.
3. Loosen a screw (PSW3×8) shown in the figure, remove the CTL head block from the unit.

Note : Never contact the CTL head to the upper drum assembly when removing the CTL head.

4. Loosen two screws (P2×3) at the bottom of the head, and remove the CTL head.



Installation

5. Clean a CTL head side bracket and the installation surface of a new CTL head with a cleaning piece moistened with cleaning fluid.
6. Install the CTL head with two screws (P2×3).
7. Install the assembled CTL head block to the unit.

8. Solder two lead wires to the CTL head.

Note :Solder red lead wire to left side, and white lead wire to right side looking it from the front.

9. Clean the CTL head and TG-4 tape guide with cleaning piece moistened with cleaning fluid.

Adjustment after replacement

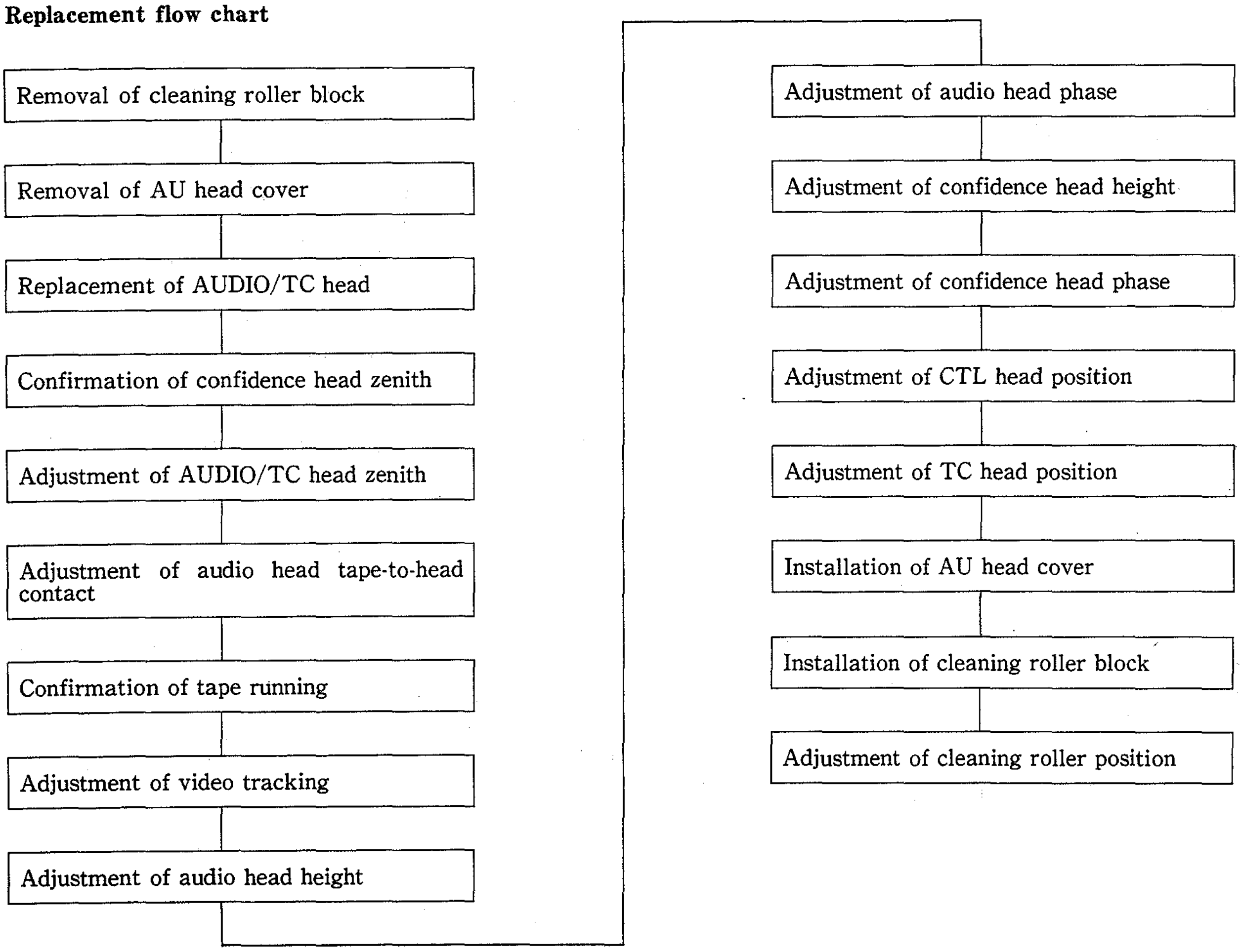
10. Perform video tracking adjustment. (Refer to Section 5-5.)
11. Perform CTL head height adjustment. (Refer to Section 5-6.)
12. Perform CTL head position adjustment. (Refer to Section 5-7.)
13. Perform TC head position adjustment. (Refer to Section 5-14.)

4-26. AUDIO/TC HEAD REPLACEMENT

Tools

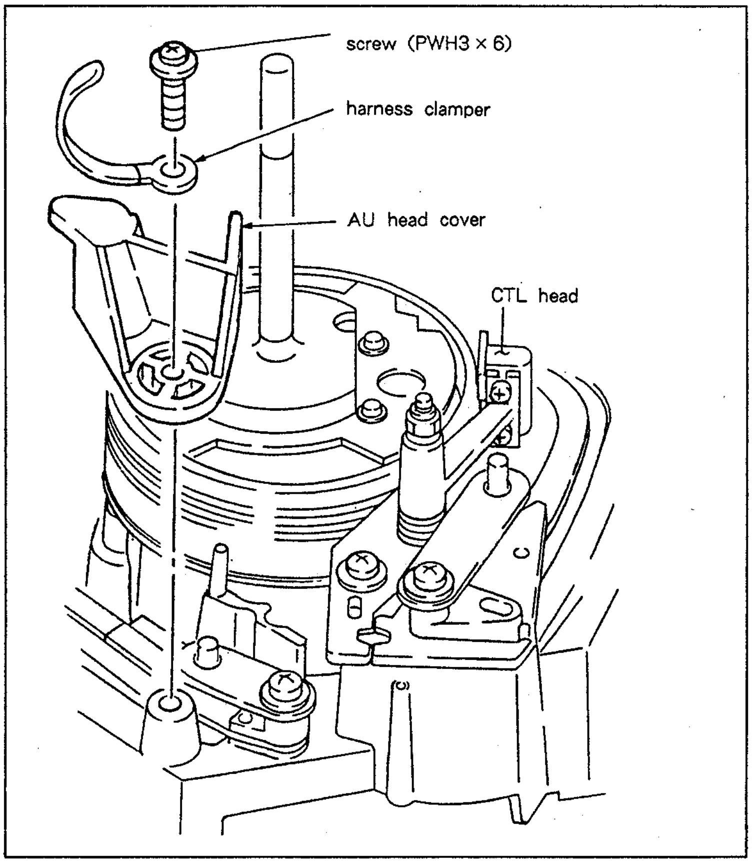
Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01

Replacement flow chart

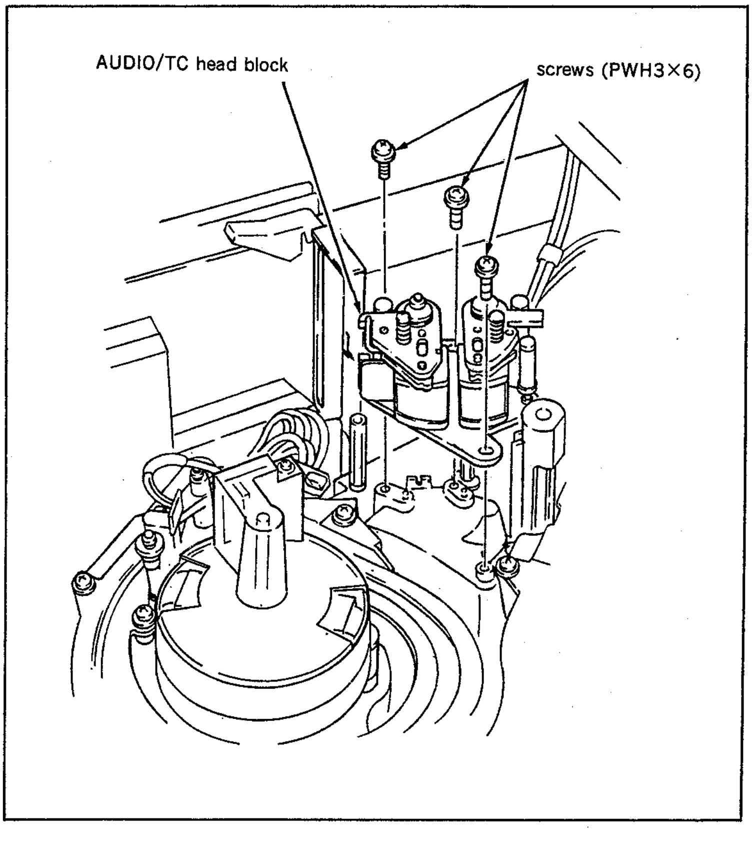

Removal of cleaning roller block
Removal of AU head cover
Replacement of AUDIO/TC head
Confirmation of confidence head zenith
Adjustment of AUDIO/TC head zenith
Adjustment of audio head tape-to-head contact
Confirmation of tape running
Adjustment of video tracking
Adjustment of audio head height
Adjustment of audio head phase
Adjustment of confidence head height
Adjustment of confidence head phase
Adjustment of CTL head position
Adjustment of TC head position
Installation of AU head cover
Installation of cleaning roller block
Adjustment of cleaning roller position

Removal

1. Remove a cleaning roller block. (Refer to steps (1) and (2) in Section 4-6.)
2. Remove a screw (PWH3×6), and remove an AU head cover. At this time, the harness clamper of the drum comes off together.
3. Disconnect connectors from an AUDIO/TC head and confidence head which connected with RP-53P board and MB-394 board.
4. Remove the head harness from the harness clamper.


screw (PWH3 x 6)
harness clamper
AU head cover
CTL head

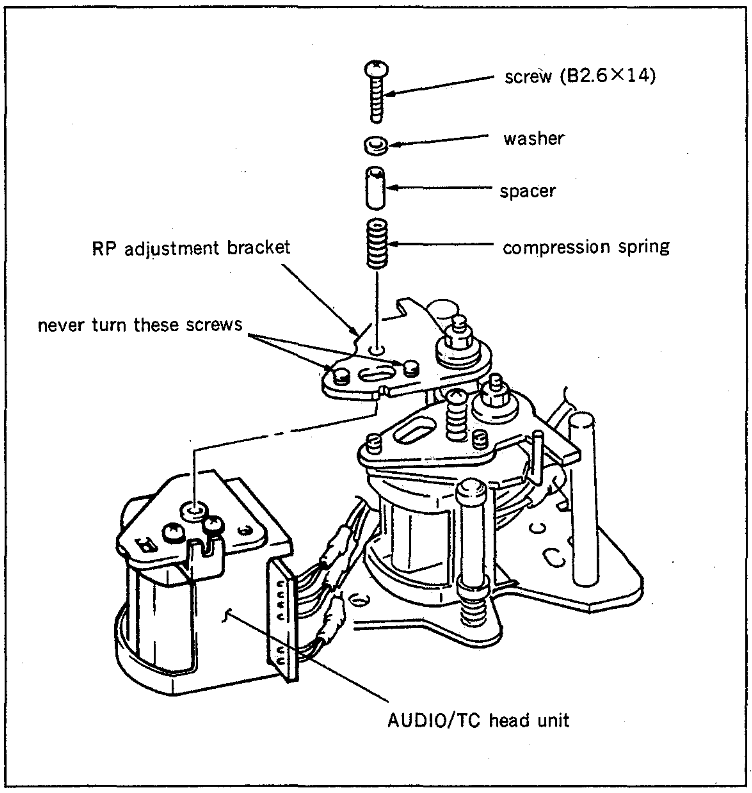
5. Remove three screws (PSW3×8) which hold the AUDIO/TC head block, and remove the head block from the unit.


AUDIO/TC head block
screws (PWH3×6)

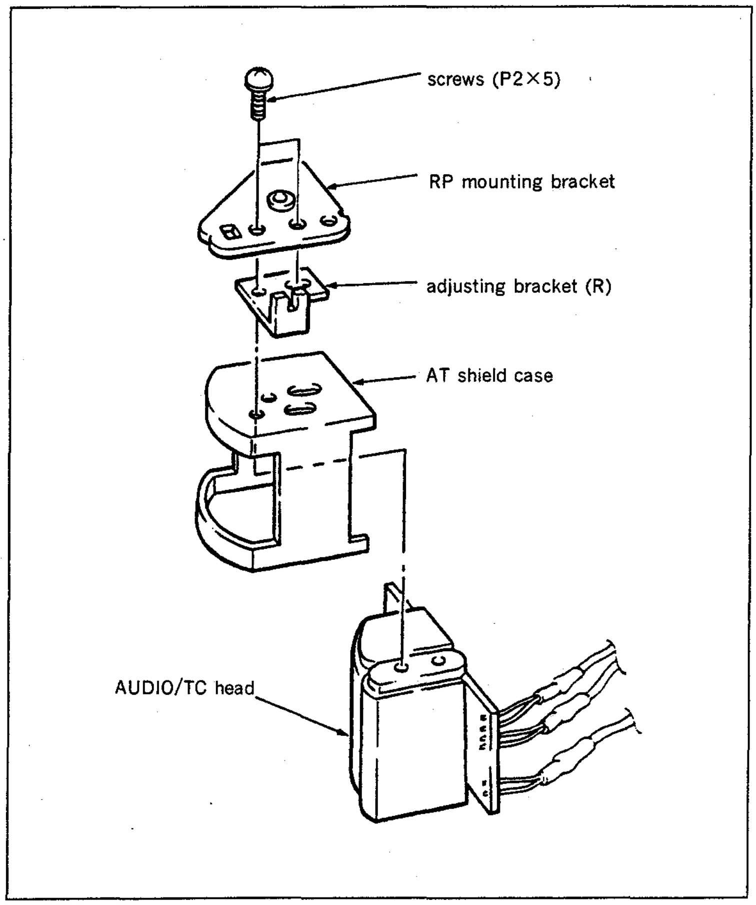
6. Remove a screw (B2.6×14) as shown in the figure, and remove the AUDIO/TC head unit from a RP adjustment bracket.

Note 1 : When removing the screw, pay particular attention not to lose a spacer, compression spring and washer which come off with the screw.

Note 2 : Do not loosen or tighten the two setscrews.


screw (B2.6×14)
washer
spacer
compression spring
RP adjustment bracket
never turn these screws
AUDIO/TC head unit

7. Unsolder all lead wires which connected with the head board.
8. Remove two screws (P2×5) as shown in the figure and remove the AUDIO/TC head.


screws (P2×5)
RP mounting bracket
adjusting bracket (R)
AT shield case
AUDIO/TC head

Installation

9. Clean the installing surface of a new AUDIO/TC head with a cleaning piece moistened with cleaning fluid.
10. Install the AUDIO/TC head, adjusting bracket (R) and RP mounting bracket to the holes on an AT shield case as shown in the figure with two screws.
11. Solder the connectors and lead wires to the AUDIO/TC head board.
    To face in front of the head,
    Left: Connector CN910
    Right: From the top
    Red (with yellow tube)
    White (with yellow tube)
    White (with red tube)
    Red (with red tube)
    Red (with white tube)
    White (with white tube)
12. Install the assembled AUDIO/TC head unit to the RP adjustment bracket.
13. Clean the tape running surface of the AUDIO/TC head with a cleaning piece moistened with cleaning fluid.
14. Install the AUDIO/TC head block with three screws.

Adjustment after replacement

15. Perform confirmation of confidence head zenith.
    (Refer to Section 5-2.)
16. Perform AUDIO/TC head zenith adjustment.
    (Refer to Section 5-3.)
17. Perform AUDIO head tape-to-head contact adjustment. (Refer to Section 5-10.)
18. Perform confirmation of tape running.
    (Refer to Section 5-4.)
19. Perform video tracking adjustment.
    (Refer to Section 5-5.)
20. Perform audio head height adjustment.
    (Refer to Section 5-8.)
21. Perform audio head phase adjustment.
    (Refer to Section 5-9.)
22. Perform confidence head height adjustment.
    (Refer to Section 5-11.)
23. Perform confidence head phase adjustment.
    (Refer to Section 5-12.)
24. Perform CTL head position adjustment.
    (Refer to Section 5-7.)

25. Perform TC head position adjustment.
    (Refer to Section 5-14.)
26. Install the AU head cover and harness clamper of drum harness.
27. Install the cleaning roller block.
    (Refer to steps (7) and (8) in Section 4-6.)
28. Perform cleaning roller position adjustment.
    (Refer to Section 4-6-1.)

4-27. CAPSTAN MOTOR REPLACEMENT

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01

Replacement flow chart

Removal of pinch press block

Replacement of capstan motor

Installation of pinch press block

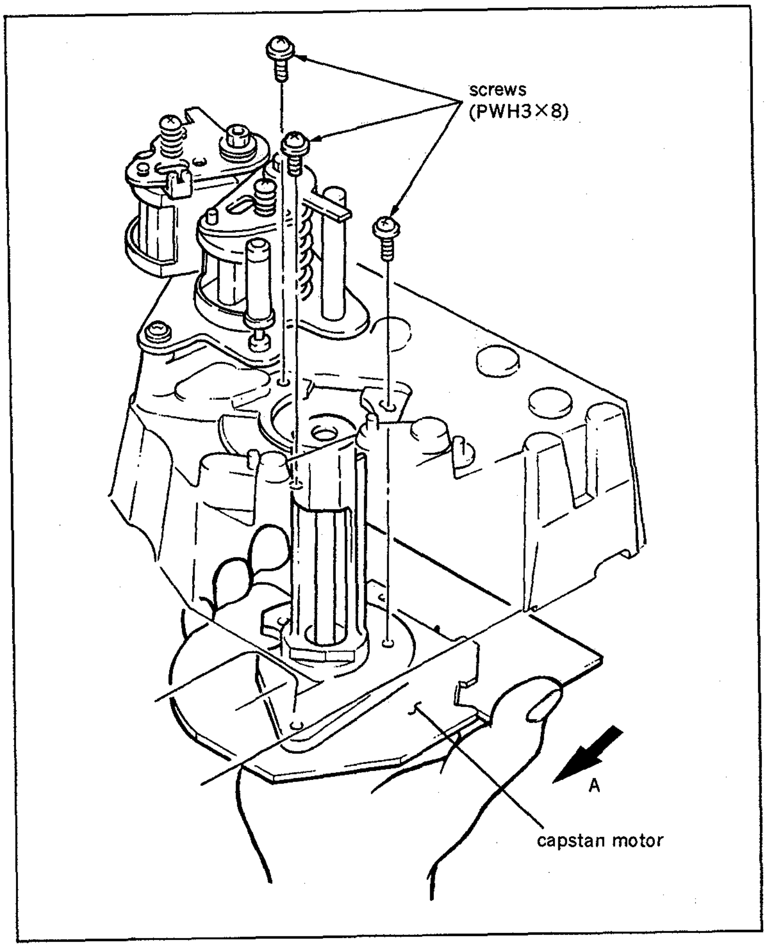
Adjustment of capstan FG duty

Adjustment of capstan free speed

Confirmation of capstan motor operation

Confirmation of pinch solenoid position

Confirmation of tape running



Removal

1. Make sure that the unit is into unthreading end mode.
2. Set the unit up with the left side panel to the bottom.
3. Open DR-118B board.
4. Disconnect a connector of a capstan motor at the back side of the unit.
5. Disconnect three connectors CN914, CN915 and CN916 which connected with PD-56 board on the pinch press block.
6. Remove two screws which holding a pinch press block, and remove it from the chassis. (Refer to Section 4-22.)
7. Remove three fixing screws (PWH3×8) of the capstan motor from the top of the unit while holding the capstan motor with hand from the back side of the unit.

Note 1 : Hold the capstan motor with hands to prevent it dropping.

Note 2 : Pay particular attention not to cause damage to the tape guide around the capstan motor.

Installation

8. Clean the installing surfaces of a new capstan motor and the chassis with a cleaning piece moistened with cleaning fluid.
9. Install the capstan motor to the chassis.

Note 1 : Pay particular attention not to cause damage to the capstan shaft.

Note 2 : Pay particular attention not to cause damage to the tape guide around the capstan motor.

10. While pressing the capstan motor, install the capstan motor with three screws (PWH3×8).
11. Connect the capstan motor connector.
12. Close DR-118B board, and place the unit to the original position.
13. Clean the capstan shaft with a cleaning piece moistened with cleaning fluid.
14. Install the pinch press block to the chassis with two screws (PWH3×8).
15. Connect three connectors CN914, CN915 and CN916 with PD-56 board.

Adjustment after replacement

16. Perform capstan FG duty adjustment. (Refer to Section 4-27-2.)
17. Perform capstan speed adjustment. (Refer to Section 4-27-3.)
18. Perform confirmation of capstan motor operation. (Refer to Section 4-27-1.)
19. Perform confirmation of pinch solenoid position. (Refer to steps (1) to (9) in Section 4-22-1.)
20. Perform confirmation of tape running. (Refer to Section 5-4.)

4-27-1. Capstan Motor Operation Check

- Be sure to perform the capstan motor operation check when a capstan motor is replaced.

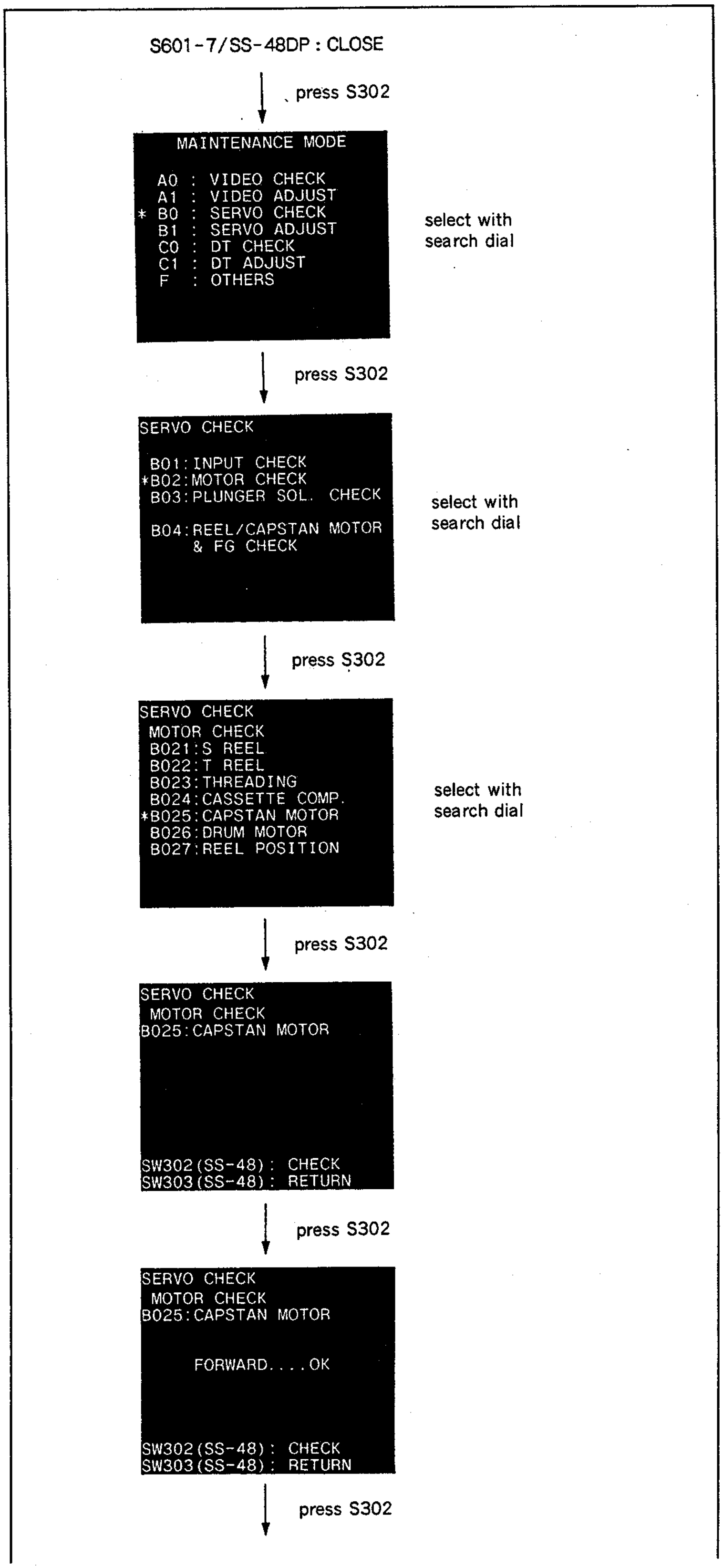
Preparation

Connect a video monitor with MONITOR connector, and display characters.

Check

1. Put Bit7 of S601 on SS-48DP board in CLOSE state, and press S302 to put the unit into maintenance mode.
2. Press the search dial to enter the jog mode, and move * mark to "BO : SERVO CHECK" which is displaying on the monitor screen with the search dial.
3. Press S302 on SS-48DP board to select "SERVO CHECK" mode.
4. Move * mark to "BO2: MOTOR CHECK" which is displaying on the monitor screen with the search dial.
5. Press S302 on SS-48DP board to select "MOTOR CHECK" menu.
6. Move * mark to "BO25: CAPSTAN MOTOR" which is displaying on the monitor screen with the search dial.
7. Press S302 on SS-48DP board to execute "CAPSTAN MOTOR" sub-menu.
8. Press S302 on SS-48DP board after "BO25: CAPSTAN MOTOR" is appeared on the monitor screen.
   Make sure that "FORWARD...OK" is appeared on the monitor screen.
9. Press S302 on SS-48DP board again.
   Make sure that "REVERSE...." appears and then "REVERSE...OK" is displayed on the monitor screen.
   If the above message does not appear, check the capstan motor drive circuit (on DR-118B board).
10. Press S303 twice on SS-48DP board to return to the mode screen.

Note : In order to finish "SERVO CHECK" mode in the maintenance mode, turn the POWER switch to OFF, and put Bit7 of S601 on SS-48DP board in OPEN state.



S601-7/SS-48DP : CLOSE

press S302

```
MAINTENANCE MODE

 A0 : VIDEO CHECK
 A1 : VIDEO ADJUST
*B0 : SERVO CHECK
 B1 : SERVO ADJUST
 C0 : DT CHECK
 C1 : DT ADJUST
 F  : OTHERS
```

select with search dial

press S302

```
SERVO CHECK

 B01:INPUT CHECK
*B02:MOTOR CHECK
 B03:PLUNGER SOL. CHECK

 B04:REEL/CAPSTAN MOTOR
     & FG CHECK
```

select with search dial

press S302

```
SERVO CHECK
 MOTOR CHECK
 B021:S REEL
 B022:T REEL
 B023:THREADING
 B024:CASSETTE COMP.
*B025:CAPSTAN MOTOR
 B026:DRUM MOTOR
 B027:REEL POSITION
```

select with search dial

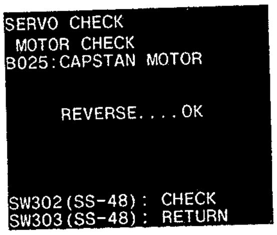
press S302

```
SERVO CHECK
 MOTOR CHECK
B025:CAPSTAN MOTOR




SW302(SS-48) : CHECK
SW303(SS-48) : RETURN
```

press S302

```
SERVO CHECK
 MOTOR CHECK
B025:CAPSTAN MOTOR

       FORWARD....OK


SW302(SS-48) : CHECK
SW303(SS-48) : RETURN
```

press S302



```
SERVO CHECK
 MOTOR CHECK
B025:CAPSTAN MOTOR

     REVERSE....OK



SW302(SS-48) :  CHECK
SW303(SS-48) :  RETURN
```

press S303 twice

S601-7/SS-48DP : OPEN

4-27-2. Capstan FG Duty Adjustment

- Be sure to perform the capstan FG duty adjustment when the capstan motor is replaced.

Preparation

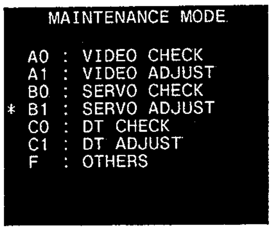
Connect a video monitor with MONITOR connector, and display characters.

Check

1. Make sure that the unit is in EJECT mode. (The automatic adjustment dose not accept the mode other than EJECT.)
2. Put Bit4 of S601 on SS-48DP board in CLOSE state. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "B1: SERVO ADJUST" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.
5. Move * mark to "B104: CAPSTAN FG DUTY" which is displaying on the monitor screen with the search dial.
6. Press S302 on SS-48DP board to execute "CAPSTAN FG DUTY".
7. Confirm that the message "COMPLETE" is displayed on the monitor screen.
   When "COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.

S601-4/SS-48DP : CLOSE

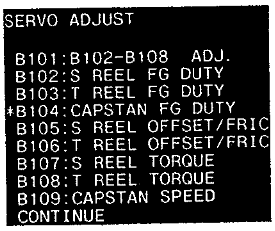
press S302



```
   MAINTENANCE MODE

  A0  :  VIDEO CHECK
  A1  :  VIDEO ADJUST
  B0  :  SERVO CHECK
* B1  :  SERVO ADJUST
  C0  :  DT CHECK
  C1  :  DT ADJUST
  F   :  OTHERS
```

select with search dial

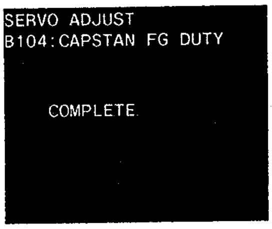
press S302



```
SERVO ADJUST

 B101:B102-B108   ADJ.
 B102:S REEL FG DUTY
 B103:T REEL FG DUTY
*B104:CAPSTAN FG DUTY
 B105:S REEL OFFSET/FRIC
 B106:T REEL OFFSET/FRIC
 B107:S REEL TORQUE
 B108:T REEL TORQUE
 B109:CAPSTAN SPEED
 CONTINUE
```

select with search dial

press S302



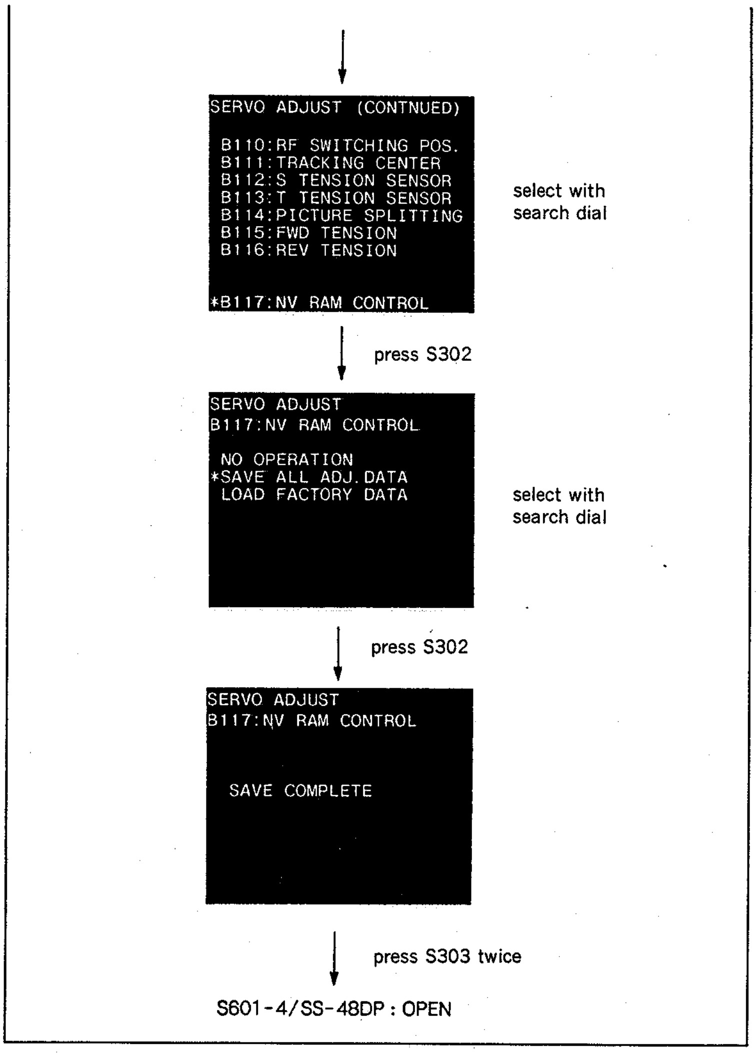
```
SERVO ADJUST
B104:CAPSTAN FG DUTY


    COMPLETE
```

press S303

8. Move * mark to ”B117 : NV RAM CONTROL” which is displaying on the monitor screen with the search dial.
9. Press S302 on SS-48DP board to execute ”NV RAM CONTROL” menu.
10. Move * mark to ”SAVE ALL ADJ. DATA” with the search dial.
11. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
12. When ”SAVE COMPLETE” is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.

Note 1 : When ”INCOMPLETE” appears on the monitor screen in step (7), press S303 on SS-48DP board to return to the menu screen.
Check the capstan motor drive circuit (on DR-118B board) and capstan FG amplifier circuit (on SS-48DP board).

Note 2 : When the SERVO ADJUST” mode is completed, turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.



```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION

*B117:NV RAM CONTROL
```

```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

```
SERVO ADJUST
B117:NV RAM CONTROL


  SAVE COMPLETE
```

4-27-3. Capstan Speed Adjustment

- Be sure to perform the capstan speed adjustment when the capstan motor is replaced.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Tool

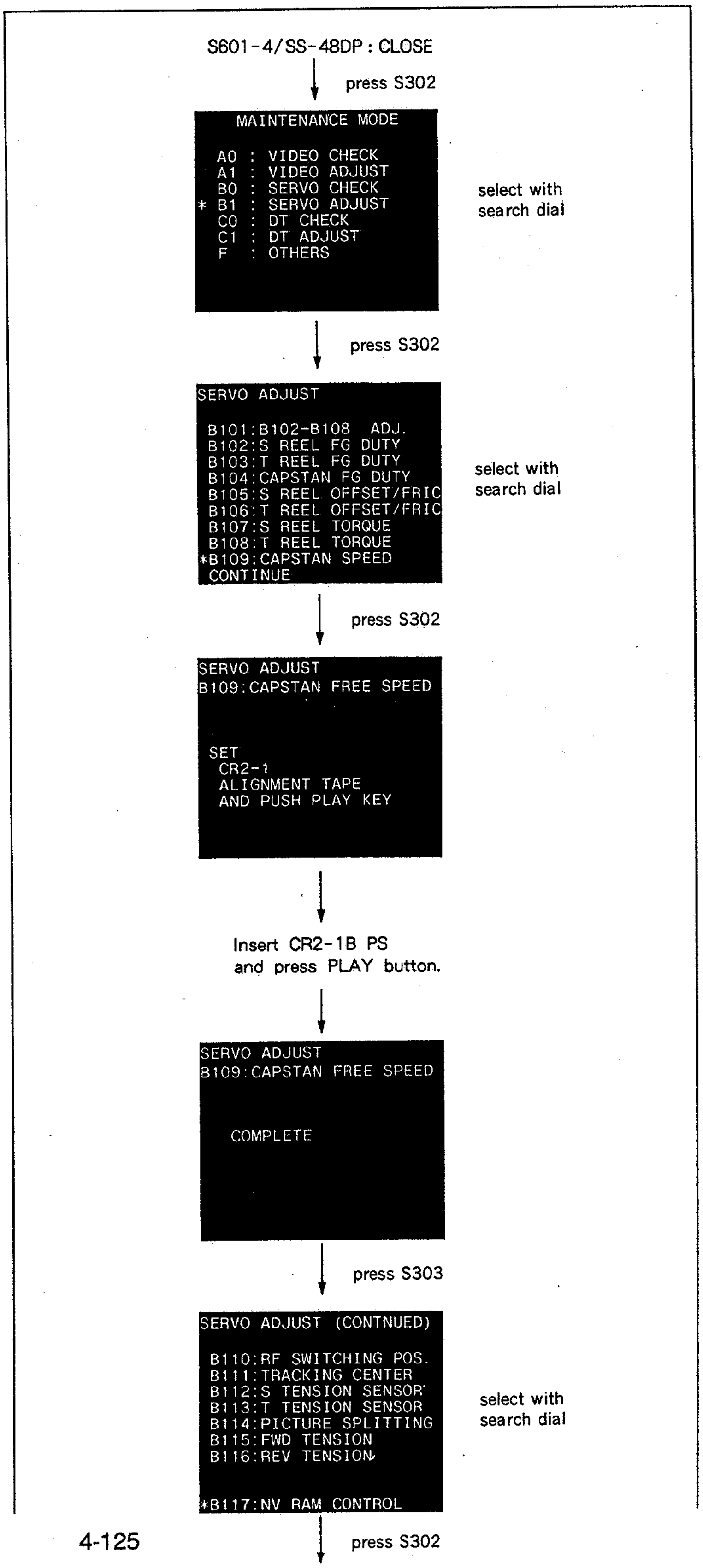
Alighnment tape CR2-1B PS : 8-960-096-51

Check

1. Make sure that the unit is in EJECT mode. (The automatic adjustment dose not accept the mode other than EJECT.)
2. Put Bit4 of S601 on SS-48DP board in CLOSE state. Push S302 and put the unit into maintenance mode.
3. Press the search dial to enter the jog mode, and move * mark to "B1 : SERVO ADJUST" which is displaying on the monitor screen with the search dial.
4. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.
5. Move * mark to "B109: CAPSTAN SPEED" which is displaying on monitor screen with the search dial.
6. Press S302 on SS-48DP board to execute "CAPSTAN FREE SPEED" menu.
7. A message "SET CR2-1 ALIGNMENT TAPE AND PUSH PLAY KEY" will be displayed on the monitor screen.
8. Insert an alignment tape CR2-1B PS, and press PLAY button.
9. Confirm that the message "COMPLETE" is displayed on the monitor screen.
   When "COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.

Note: When "INCOMPLETE" appears on the monitor screen in step (9), press S303 on SS-48DP board to return to the menu screen.
Then press EJECT button and take out the alignment tape, then check if the alignment tape is CR2-1B PS.
If it is OK, check the capstan motor drive circuit (on DR-118B board) and capstan FG amplifier circuit (on SS-48DP board).

10. Move * mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.



```
MAINTENANCE MODE

 A0 : VIDEO CHECK
 A1 : VIDEO ADJUST
 B0 : SERVO CHECK
* B1 : SERVO ADJUST
 C0 : DT CHECK
 C1 : DT ADJUST
 F  : OTHERS
```

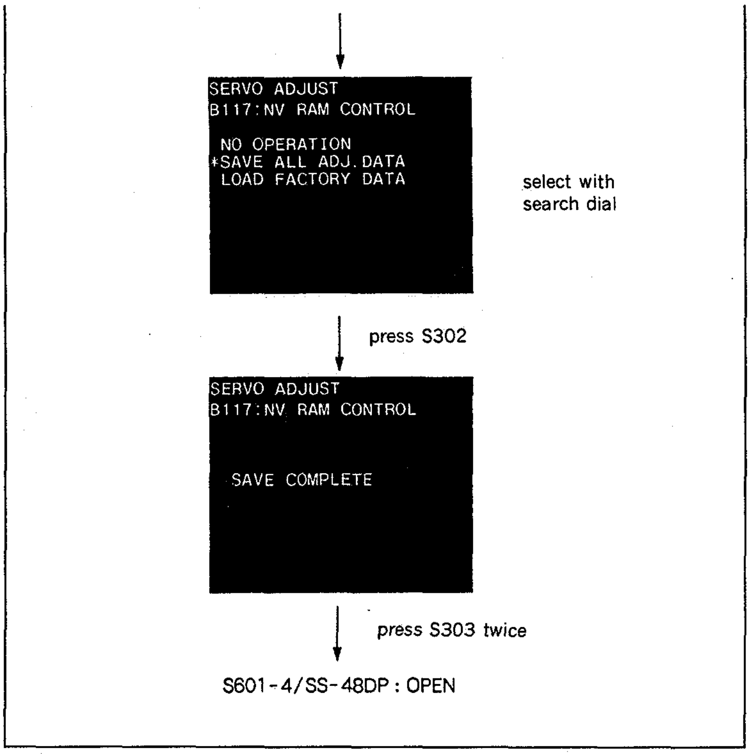
```
SERVO ADJUST

 B101:B102-B108  ADJ.
 B102:S REEL FG DUTY
 B103:T REEL FG DUTY
 B104:CAPSTAN FG DUTY
 B105:S REEL OFFSET/FRIC
 B106:T REEL OFFSET/FRIC
 B107:S REEL TORQUE
 B108:T REEL TORQUE
*B109:CAPSTAN SPEED
 CONTINUE
```

```
SERVO ADJUST
B109:CAPSTAN FREE SPEED


 SET
  CR2-1
  ALIGNMENT TAPE
  AND PUSH PLAY KEY
```

```
SERVO ADJUST
B109:CAPSTAN FREE SPEED

   COMPLETE
```

```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION

*B117:NV RAM CONTROL
```

11. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
12. Move * mark to "SAVE ALL ADJ. DATA" with the search dial.
13. Press S302 on SS-48DP board. Data will be stored on the NOV RAM.
14. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.
15. Press EJECT button and take out the alignment tape.
16. Turn the POWER to OFF and put Bit4 of S601 on SS-48DP board in OPEN state.

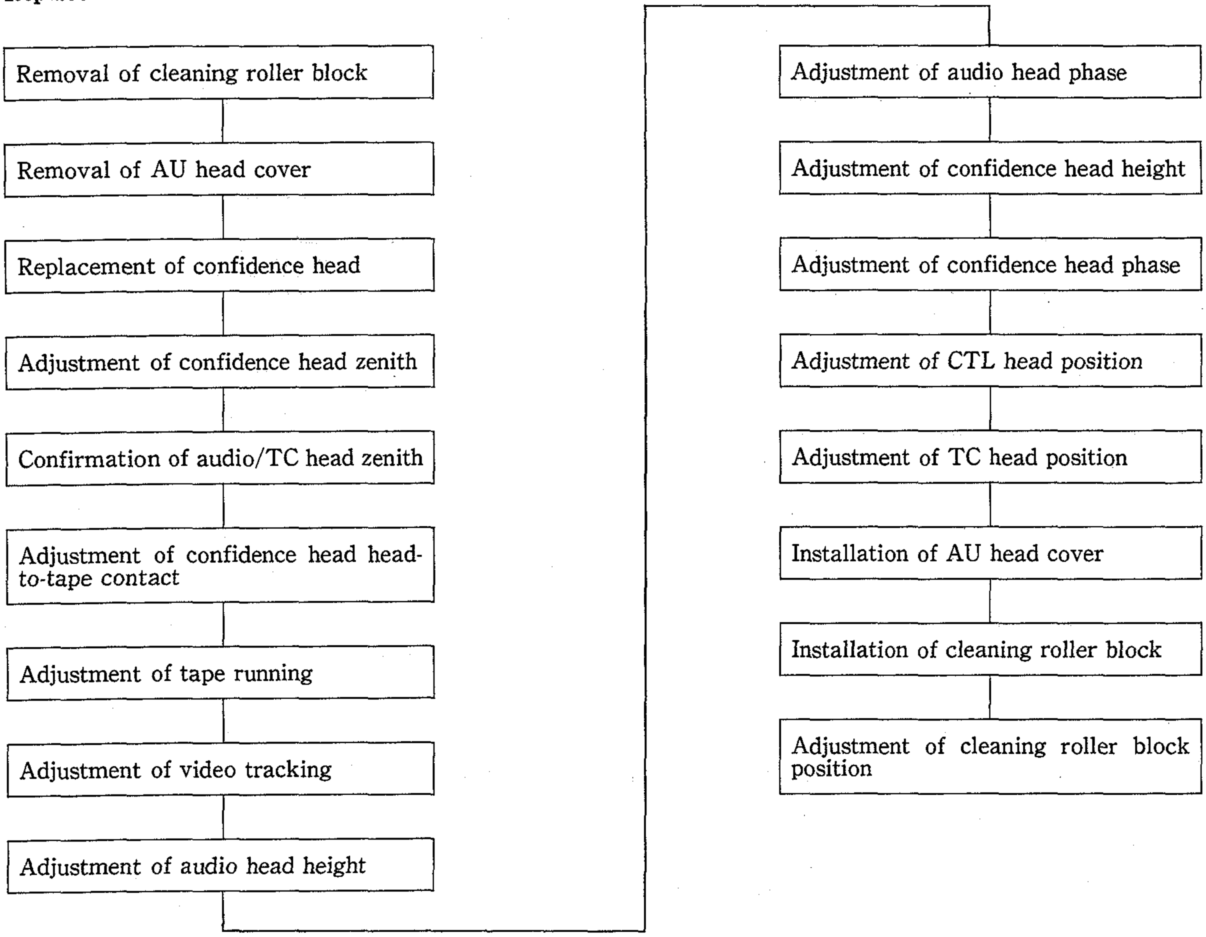

SERVO ADJUST
B117:NV RAM CONTROL
NO OPERATION
*SAVE ALL ADJ.DATA
LOAD FACTORY DATA
select with search dial
press S302
SERVO ADJUST
B117:NV RAM CONTROL
SAVE COMPLETE
press S303 twice
S601-4/SS-48DP : OPEN

4-28. CONFIDENCE HEAD REPLACEMENT

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01

Replacement flow chart


Removal of cleaning roller block
Removal of AU head cover
Replacement of confidence head
Adjustment of confidence head zenith
Confirmation of audio/TC head zenith
Adjustment of confidence head head-to-tape contact
Adjustment of tape running
Adjustment of video tracking
Adjustment of audio head height
Adjustment of audio head phase
Adjustment of confidence head height
Adjustment of confidence head phase
Adjustment of CTL head position
Adjustment of TC head position
Installation of AU head cover
Installation of cleaning roller block
Adjustment of cleaning roller block position

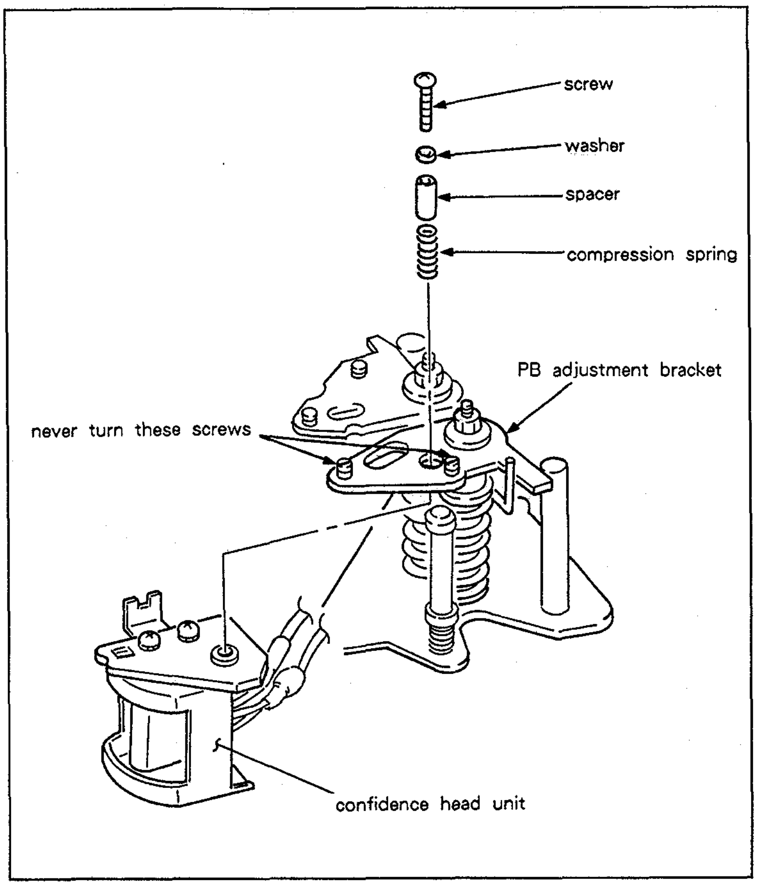
Removal

1. Remove a cleaning roller block.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove a screw (PWH3×6), and remove an AU head cover. At this time, the harness clamper of the drum comes off together.
3. Disconnect connectors from an audio/TC head and confidence head which connected with RP-53P board.
4. Remove the head harness from the harness clamper.

5. Remove three screws (PSW3×8) which hold the audio/TC head block, and remove the head block from the unit.
6. Remove a screw as shown in the figure, and remove the confidence head unit from a PB adjustment bracket.

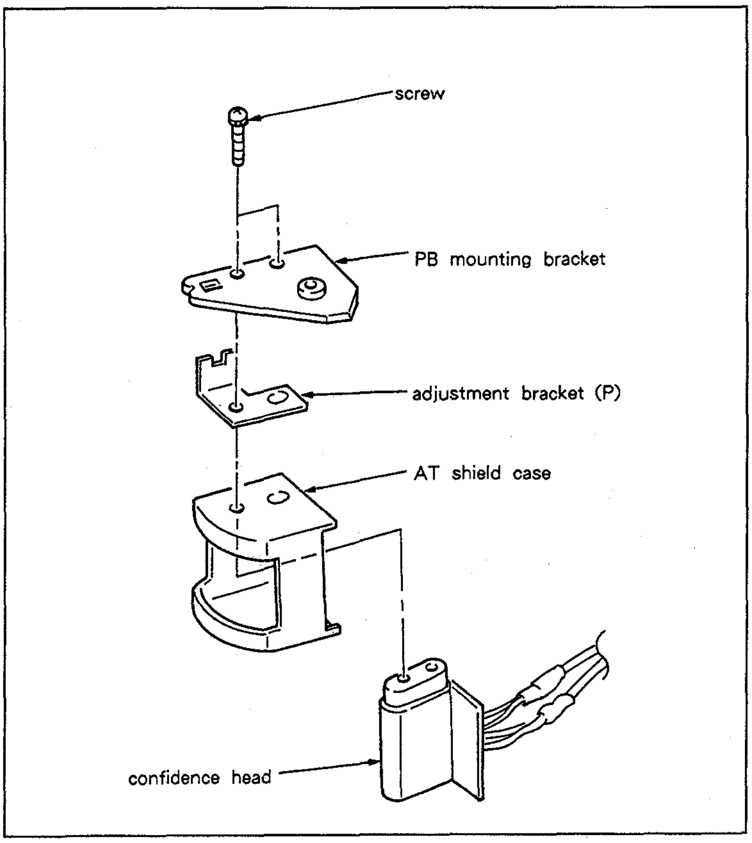
Note 1 : When removing the screw, pay particular attention not to lose a spacer, compression spring and washer which comes off with screw.
Note 2 : Do not loosen or tighten two setscrews.

7. Unsolder all lead wires which connected with the head board.
8. Remove two screws as shown in the figure and remove the confidence head.


screw
washer
spacer
compression spring
PB adjustment bracket
never turn these screws
confidence head unit

Installation

9. Clean the installation surface of a new confidence head with a cleaning piece moistened with cleaning fluid.
10. Install the confidence head, adjustment bracket (P) and PB mounting bracket to the holes on an AT shield case as shown in the figure with two screws.
11. Solder the lead wires to the confidence head board.
    To face in front of the head,
    From the top
    Red (with yellow tube)
    White (with yellow tube)
    Red (with red tube)
    White (with red tube)
12. Install the assembled confidence head unit to the PB adjustment bracket.
13. Clean the tape running surface of the confidence head with a cleaning piece moistened with a cleaning fluid.
14. Install the audio/TC head block with three screws.


screw
PB mounting bracket
adjustment bracket (P)
AT shield case
confidence head

Adjustment after replacement

15. Perform confidence head zenith adjustment. (Refer to Section 5-2.)
16. Perform confirmation of audio/TC head zenith. (Refer to Section 5-3.)
17. Perform confidence head head-to-tape contact adjustment. (Refer to Section 5-13.)
18. Perform confirmation of tape running. (Refer to Section 5-4.)
19. Perform video tracking adjustment. (Refer to Section 5-5.)

20. Perform audio head height adjustment.
    (Refer to Section 5-8.)
21. Perform audio head phase adjustment.
    (Refer to Section 5-9.)
22. Perform confidence head height adjustment.
    (Refer to Section 5-11.)
23. Perform confidence head phase adjustment.
    (Refer to Section 5-12.)
24. Perform CTL head position adjustment.
    (Refer to Section 5-7.)
25. Perform TC head position adjustment.
    (Refer to Section 5-14.)
26. Install the AU head cover and harness clamper of drum harness.
27. Install the cleaning roller block.
    (Refer to steps (7) and (8) in Section 4-6.)
28. Perform cleaning roller position adjustment.
    (Refer to Section 4-6-1.)

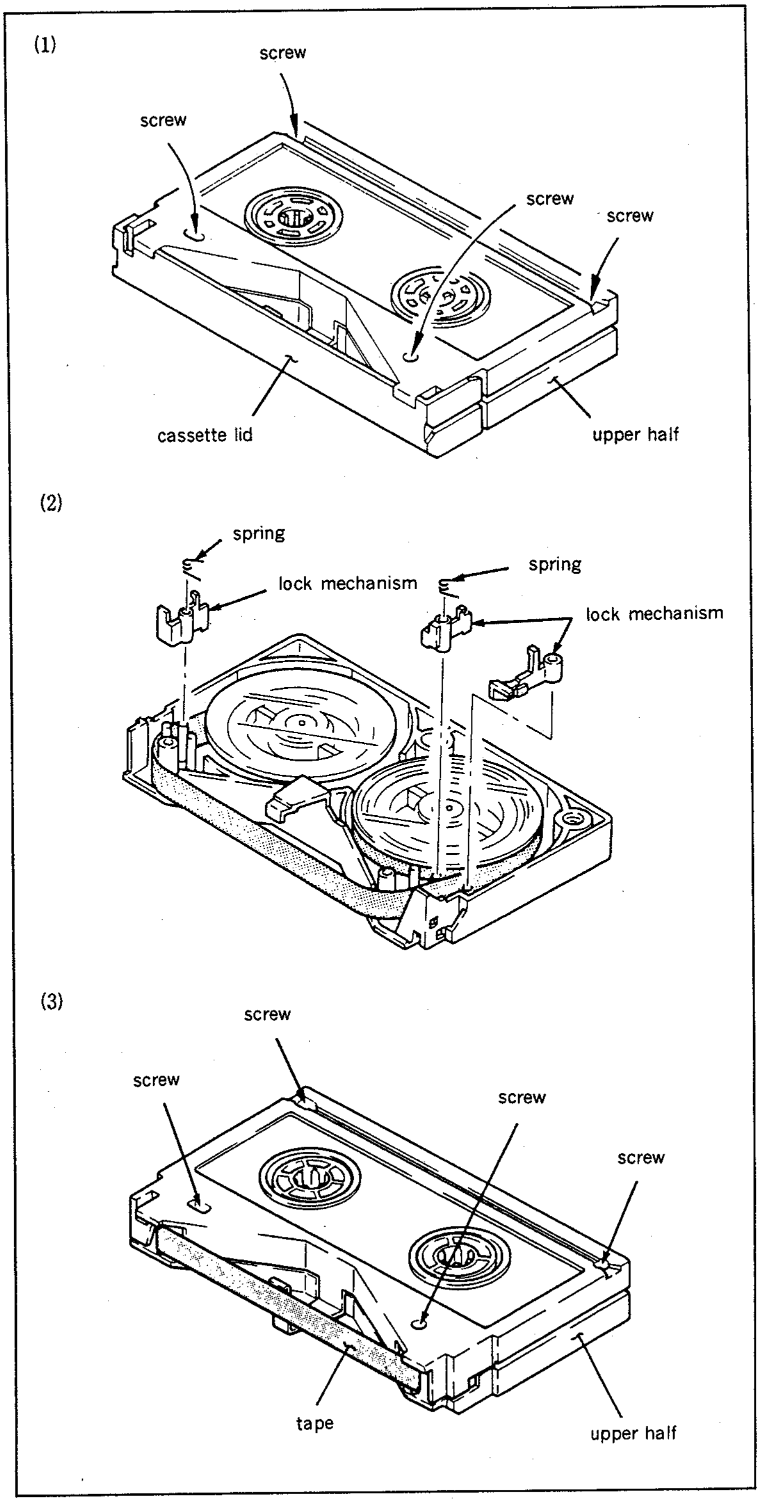
SECTION 5
TAPE RUN ALIGNMENT

5-1. GENERAL INFORMATION FOR TAPE RUN ADJUSTMENT

1. HOW TO MAKE A CASSETTE TAPE (ALIGNMENT TAPE) WITHOUT LID
   The check and adjustment cannot be performed if a cassette tape lid is installed. Remove the cassette tape lid as follows :
   (1) Remove four screws on the back of the cassette tape as shown in the figure, and remove an upper half of the cassette.
   (2) Remove the lock mechanism parts and the springs both at left and right sides, and remove the cassette lid from the upper half.
   (3) Install the upper half on the lower half with four screws from the back side.

2. ALIGNMENT TAPE
   The alignment tapes used for tape run adjustment are as follows :

   CR2-1B PS : 8-960-096-51
   CR5-2A PS : 8-960-098-44
   CR8-1A PS : 8-960-098-45


(1)
screw
screw
screw
screw
cassette lid
upper half
(2)
spring
lock mechanism
spring
lock mechanism
(3)
screw
screw
screw
screw
tape
upper half

3. TAPE GUIDE ADJUSTMENT DRIVER

During tracking adjustment, rotate the flange on the tape guide in order to obtain the most desirable tape path. At that time, use the tape guide adjustment driver.

Tape guide adjustment driver : J-6321-500-A

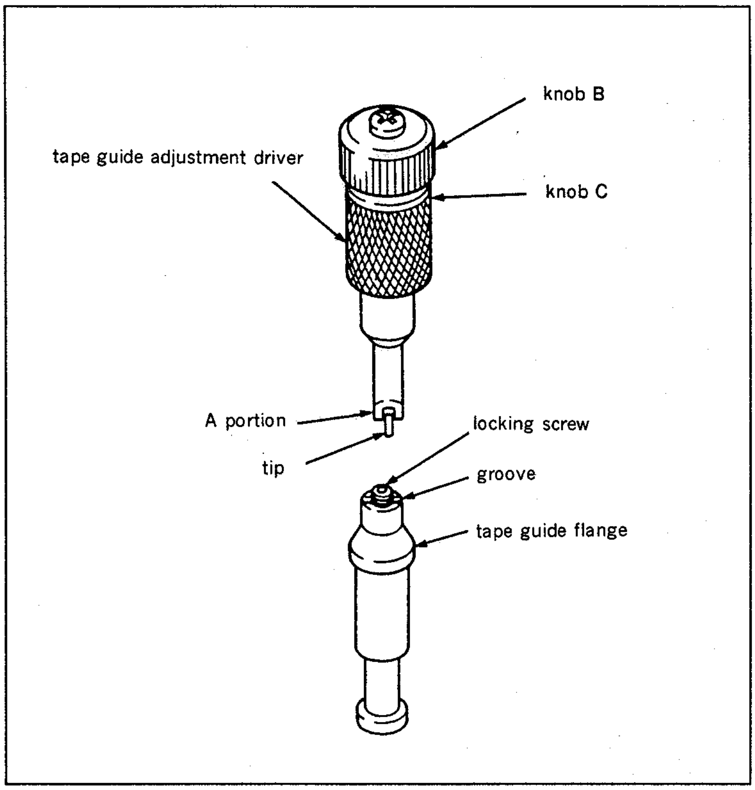
Here is the explanation about how to use the tape guide adjustment driver.

(1) Align A portion (flatblade) with the groove of the tape guide flange.

(2) Fix knob C, rotate knob B, and loosen locking screw.

(3) Align the tip of knob B with the hole of locking screw of the tape guide. Fix knob B and rotate knob C. Then, the upper flange of the tape guide is rotated.

(4) In order to tighten the locking screw of the tape guide flange, firstly, fix the knob C, then rotate the knob B. (Tightening torque: 9.8 to 11.7 N•cm {1.0 to 1.2 kgf•cm})



4. CASSETTE COMPARTMENT

Install the cassette compartment in the unit before performing the tape run adjustment. This enables more accurate adjustment.

5. REQUIRED OPERATION TO REMOVE RESIDUAL DISTORTION FROM DT HEAD BEFORE ATTEMPTING VIDEO TRACKING ADJUSTMENT

Since this machine is equipped with DT (dynamic tracking) playback function, video head is mounted on bimorph substrate. The bimorph substrate has the nature to bent itself depending upon the amount of voltage output from control circuit, during variable playback mode. Due to this nature, there can be some residual distortion left in the bimorph, in some timings of POWER OFF.

This residual distortion has no adverse effect in normal playback operation. But, when attempting the video tracking adjustment that has serious effect on tape-to-tape interchangeability, the DT video head should be positioned in mechanical default position.

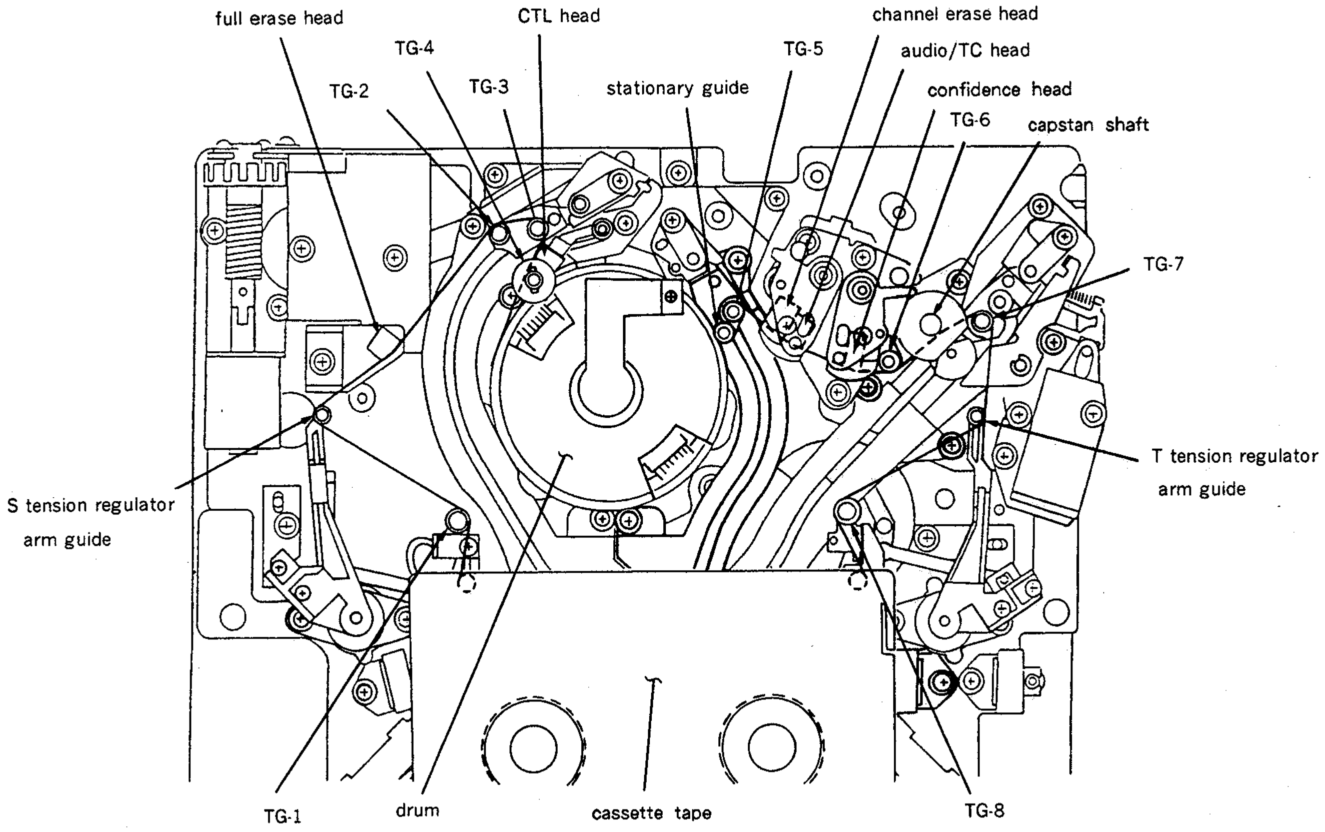
Before attempting video tracking adjustment, be sure to remove the residual distortion from DT head, by following procedure below.

Before attempting this operation, perform DT head distortion waveform adjustment referring to electrical alignment.

(1) Turn POWER to OFF.
(2) Set Bits 1, 2 and 5 of S2 on DT-28 (B-1) board to ON state respectively.
(3) Turn POWER to ON.
(4) Press EJECT button to put the unit into EJECT mode.
(5) Press S1 on DT-28 board (A-1) (entering the distortion removal mode), and make sure that red LED D10 on DT-28 board (A-1) lights ON about 22 seconds.
(6) After the LED turns OFF, turn POWER to OFF.
(7) Reset Bits 1, 2 and 5 of S2 on DT-28 board to OFF state.

6. LOCATION OF HEADS AND TAPE GUIDES

The location of heads and tape guides listed up in the adjustment item is shown in the figure.


full erase head
CTL head
channel erase head
TG-4
TG-5
audio/TC head
TG-2
TG-3
stationary guide
confidence head
TG-6
capstan shaft
TG-7
T tension regulator
arm guide
S tension regulator
arm guide
TG-1
drum
cassette tape
TG-8

7. PROCEDURE TO OPERATE THE TRACKING CONTROL IN DT MODE

The TRACKING control knob is provided on the front panel, but this TRACKING control knob cannot operate as the tracking control in DT mode.

But the manual tracking control is required during in the video tracking adjustment in DT mode.

For this purpose, SETUP MENU has the special item that serves for this adjustment. Use the search dial to operate the tracking control function.

Practical procedures are described as follows.

After completion of adjustment, be sure to return all the settings to the factory shipment conditions.

(Setting procedures)

(1) Put Bit 1 of S2 on SS-48DP board (P-1) in CLOSE state.

(2) Press the MENU button of SYSTEM SETUP on the sub-control panel to enter the SETUP MENU mode.

(3) While pressing PLAY button, rotate search dial to select the ITEM-913.

(4) While pressing SEARCH button, rotate search dial to obtain the data of 1 (ON).

(5) Press the SET button of SYSTEM SETUP on the sub-control panel to memorize the data into NV RAM.

(Operating procedures)

- * TRACKING control FIX position
  When the search dial is in the STILL position of SHUTTLE mode.
- * Tracking control function
  Rotate the search dial clockwise or counterclockwise in SHUTTLE mode. It gives the same function as TRACKING control.

(Procedure to exit from the manual tracking mode)

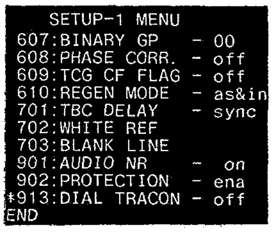
(6) Press the MENU button of SYSTEM SETUP on the sub-control panel to enter the SETUP MENU mode.

(7) While pressing PLAY button, rotate search dial to select the ITEM-913.

(8) While pressing SEARCH button, rotate search dial to obtain the data of 0 (OFF).

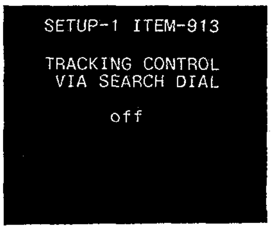
(9) Press the SET button of SYSTEM SETUP on the sub-control panel to memorize the data into NV RAM.

(10) Put Bit1 of S2 on SS-48DP board (P-1) in OPEN state.

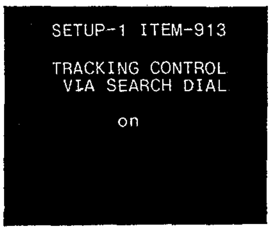


```
   SETUP-1 MENU
 607:BINARY GP     - 00
 608:PHASE CORR.   - off
 609:TCG CF FLAG   - off
 610:REGEN MODE    - as&in
 701:TBC DELAY     - sync
 702:WHITE REF
 703:BLANK LINE
 901:AUDIO NR      -  on
 902:PROTECTION    - ena
*913:DIAL TRACON   - off
END
```

While pressing the PLAY button, select with searcth dial

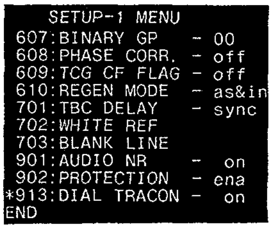


```
  SETUP-1 ITEM-913

  TRACKING CONTROL
   VIA SEARCH DIAL

        off
```



```
  SETUP-1 ITEM-913

  TRACKING CONTROL
   VIA SEARCH DIAL

        on
```

While pressing the SEARCH button, turn the search dial to make data "1" (ON)



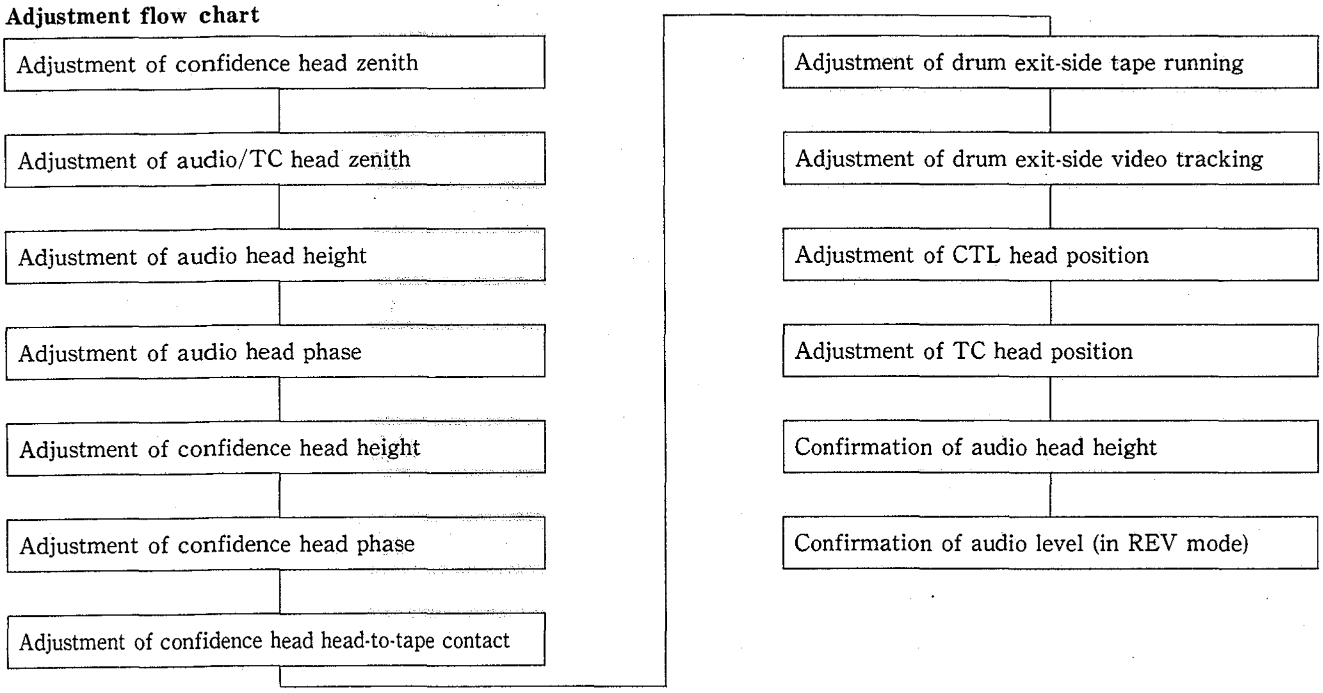
```
   SETUP-1 MENU
 607:BINARY GP     - 00
 608:PHASE CORR.   - off
 609:TCG CF FLAG   - off
 610:REGEN MODE    - as&in
 701:TBC DELAY     - sync
 702:WHITE REF
 703:BLANK LINE
 901:AUDIO NR      -  on
 902:PROTECTION    - ena
*913:DIAL TRACON   -  on
END
```

5-2. CONFIDENCE HEAD ZENITH ADJUSTMENT

Tools

Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
Flatness plate : J-6086-570-A

Adjustment flow chart


Adjustment of confidence head zenith
Adjustment of audio/TC head zenith
Adjustment of audio head height
Adjustment of audio head phase
Adjustment of confidence head height
Adjustment of confidence head phase
Adjustment of confidence head head-to-tape contact
Adjustment of drum exit-side tape running
Adjustment of drum exit-side video tracking
Adjustment of CTL head position
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio level (in REV mode)

Check

1. Put the unit into unthreading end mode.
2. Place the flatness plate to a TG-6 tape guide, then push it lightly against a confidence head.

Note :Pay particular attention not to scratch the tape contacting surface of the confidence head.

3. While pressing the flatness plate against the TG-6 tape guide with finger, push the upper part of the flatness plate in front of the confiedence head softly with fingers of the other hand. Then, push the lower part of the flatness plate in front of the confiedence head softly with fingers of the other hand.

Specification : The flatness plate must not move when pushed the upper part. (In other words, no clearance shall exist between the flatness plate and head.)

The flatness plate must not move or a little move when pushed the lower part.

The clearance between the flatness plate and head lower part (moving distance) is acceptable less than 0.05 mm.

- The confirmation procedure of 0.05 mm clearance:

  (1) Turn the zenith adjustment screw in counterclockwise so that the flatness plate must not move when pushed the upper and lower parts.

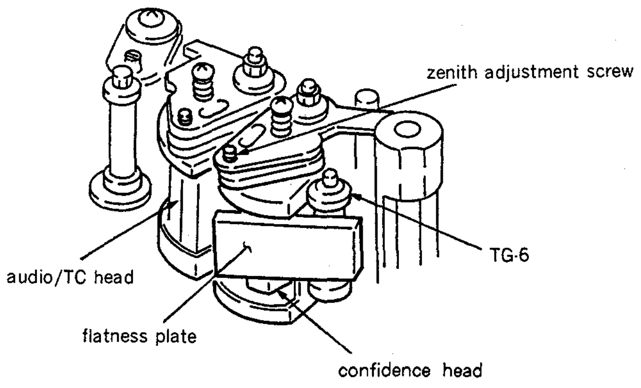
  (2) Turn the zenith adjustment screw in clockwise 50 degrees, the 0.05 mm clearance between the flatness plate and head lower part exists.

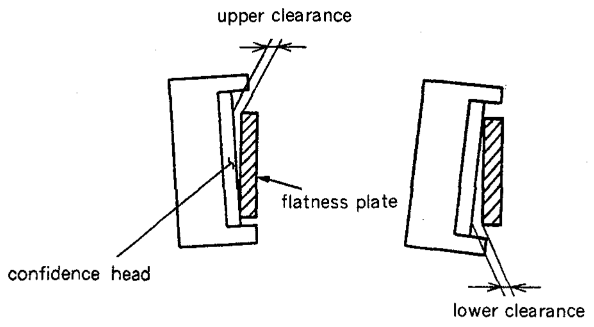
If the specification is satisfied, perform steps (5) and later.

If the specification is not satisfied, perform steps (4) and later.

Adjustment

4. If the clearance at the lower part does not meet the specification:
   turn the zenith adjustment screw in counterclockwise to satisfy the above specification.
   If the clearance at the upper part does not meet the specification:
   turn the zenith adjustment screw in clockwise to satisfy the above specification.
5. Clean the confidence head and TG-6 tape guide with a cleaning piece moistened with cleaning fluid.
6. Perform audio/TC head zenith adjustment. (Refer to Section 5-3.)
7. Perform audio head height adjustment. (Refer to Section 5-8.)
8. Perform audio head phase adjustment. (Refer to Section 5-9.)
9. Perform confidence head height adjustment. (Refer to Section 5-11.)
10. Perform confidence head phase adjustment. (Refer to Section 5-12.)





Spec. : Upper clearance must not exist.
Lower clearance is acceptable less than 0.05 mm.

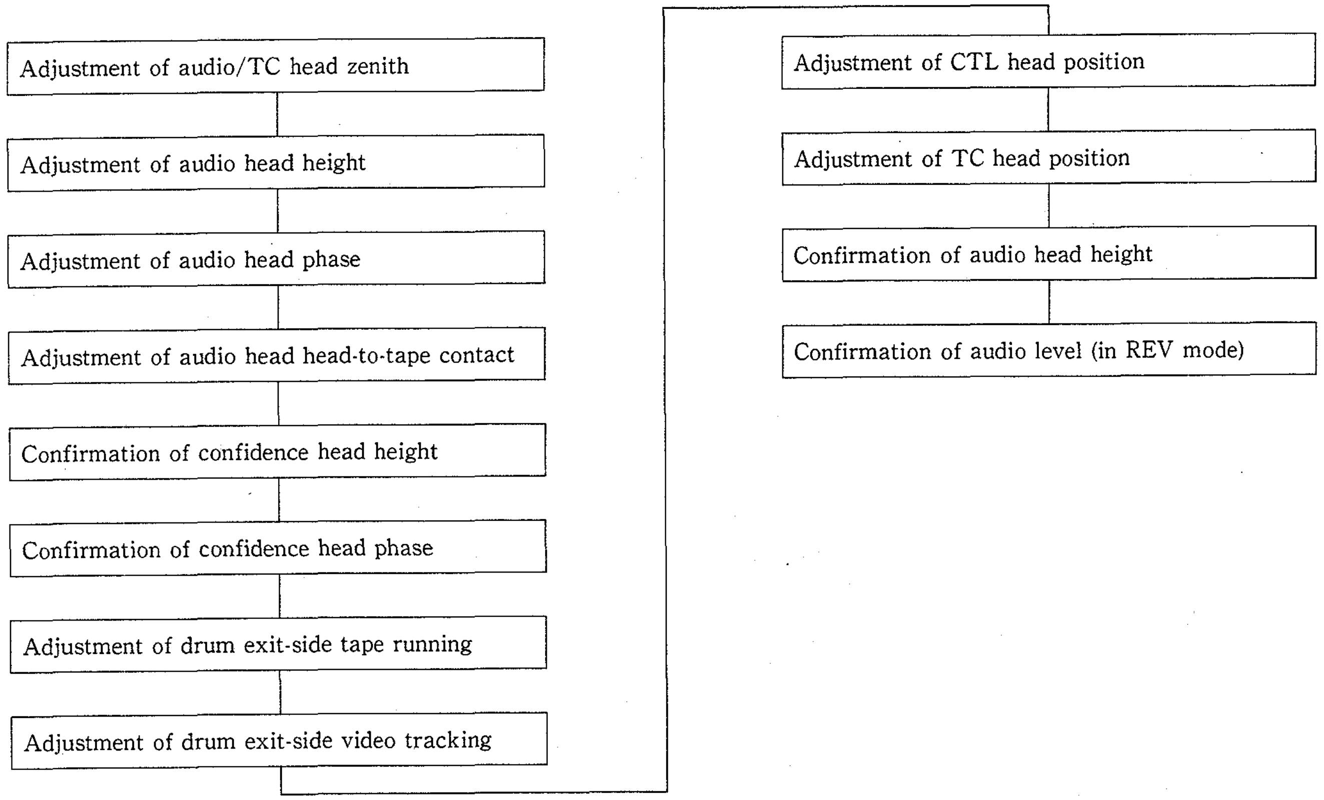
11. Perform confidence head head-to-tape contact adjustment. (Refer to Section 5-13.)
12. Perform drum exit-side tape running adjustment. (Refer to Section 5-4.)
13. Perform drum exit-side video tracking adjustment. (Refer to Section 5-5.)
14. Perform CTL head position adjustment. (Refer to Section 5-7.)
15. Perform TC head position adjustment. (Refer to Section 5-14.)
16. Perform reconfirmation of audio head height. (Refer to steps (1) through (3) in Section 5-8.)
17. Perform confirmation of audio level (in REV mode). (Refer to steps (1) through (4) in Section 5-15.)

5-3. AUDIO/TC HEAD ZENITH ADJUSTMENT

Tools

Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
Flatness plate : J-6086-570-A

Adjustment flow chart


Adjustment of audio/TC head zenith
Adjustment of audio head height
Adjustment of audio head phase
Adjustment of audio head head-to-tape contact
Confirmation of confidence head height
Confirmation of confidence head phase
Adjustment of drum exit-side tape running
Adjustment of drum exit-side video tracking
Adjustment of CTL head position
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio level (in REV mode)

Check

1. Put the unit into unthreading end mode.
2. Place the flatness plate to a confidence head, then push it lightly against an audio/TC head.

Note : Pay particular attention not to scratch the tape contacting surfaces, of the audio/TC head and confidence head.

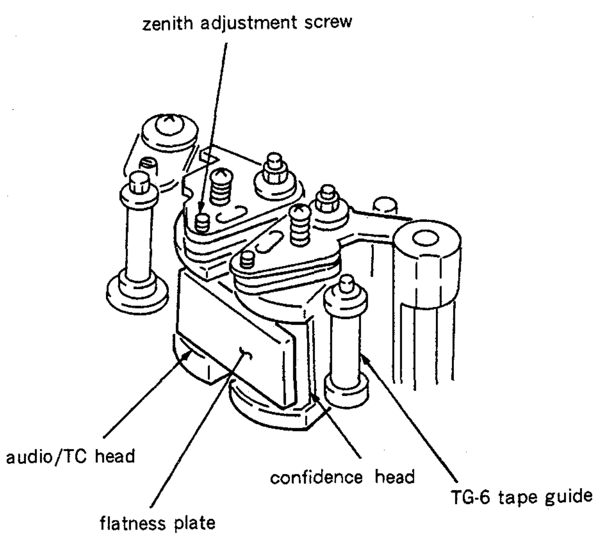
3. While pressing the flatness plate against the confidence head with finger, push the upper part of the flatness plate in front of the audio/TC head softly with fingers of the other hand. Then, push the lower part of the flatness plate in front of the audio/TC head softly with fingers of the other hand.

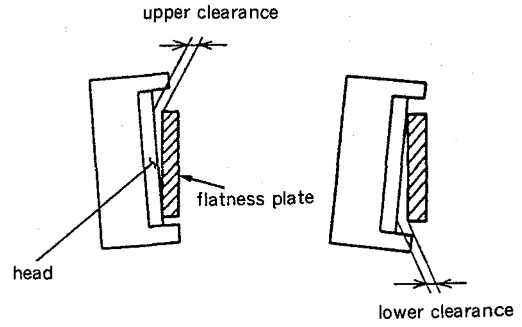
Specification : The flatness plate must not move when pushed the upper part. (In other words, no clearance shall exist between the flatness plate and head.)
The flatness plate must not move or a little move when pushed the lower part.
The clearance between the flatness plate and head at lower part (moving distance) is acceptable less than 0.05 mm.
- The confirmation procedure of 0.05 mm clearance :
(1) Turn the zenith adjustment screw in counterclockwise so that the flatness plate must not move when pushed the upper and lower parts.
(2) Turn the zenith adjustment screw in clockwise 50 degrees, the 0.05 mm clearance between the flatness plate and head at lower part exists.

If the specification is satisfied, perform steps (5) and later.
If the specification is not satisfied, perform steps (4) and later.

Adjustment

4. If the clearance at the lower part does not meet the specification :
turn the zenith adjustment screw in counterclockwise to satisfy the above specification.
If the clearance at the upper part does not meet the specification :
turn the zenith adjustment screw in clockwise to satisfy the above specification.
5. Clean the audio/TC head and confidence head with a cleaning piece moistened with cleaning fluid.
6. Perform audio head height adjustment.
(Refer to Section 5-8.)
7. Perform audio head phase adjustment.
(Refer to Section 5-9.)
8. Perform audio head head-to-tape contact adjustment. (Refer to Section 5-10.)
9. Perform confidence head height confirmation.
(Refer to steps (1) through (4) in Section 5-11.)


zenith adjustment screw
audio/TC head
confidence head
TG-6 tape guide
flatness plate


upper clearance
flatness plate
head
lower clearance

Spec. : Upper clearance must not exist.
Lower clearance is acceptable less than 0.05 mm.

10. Perform confidence head phase confirmation. (Refer to steps (1) through (5) in Section 5-12.)
11. Perform drum exit-side tape running adjustment. (Refer to Section 5-4.)
12. Perform drum exit-side video tracking adjustment. (Refer to Section 5-5.)
13. Perform CTL head pontion adjustment. (Refer to section 5-7.)
14. Perform TC head position adjustment. (Refer to Section 5-14.)
15. Perform reconfirmation of audio head height. (Refer to steps (1) through (3) in Section 5-8.)
16. Perform confirmation of audio level (in REV mode). (Refer to steps (1) through (4) in Section 5-15.)

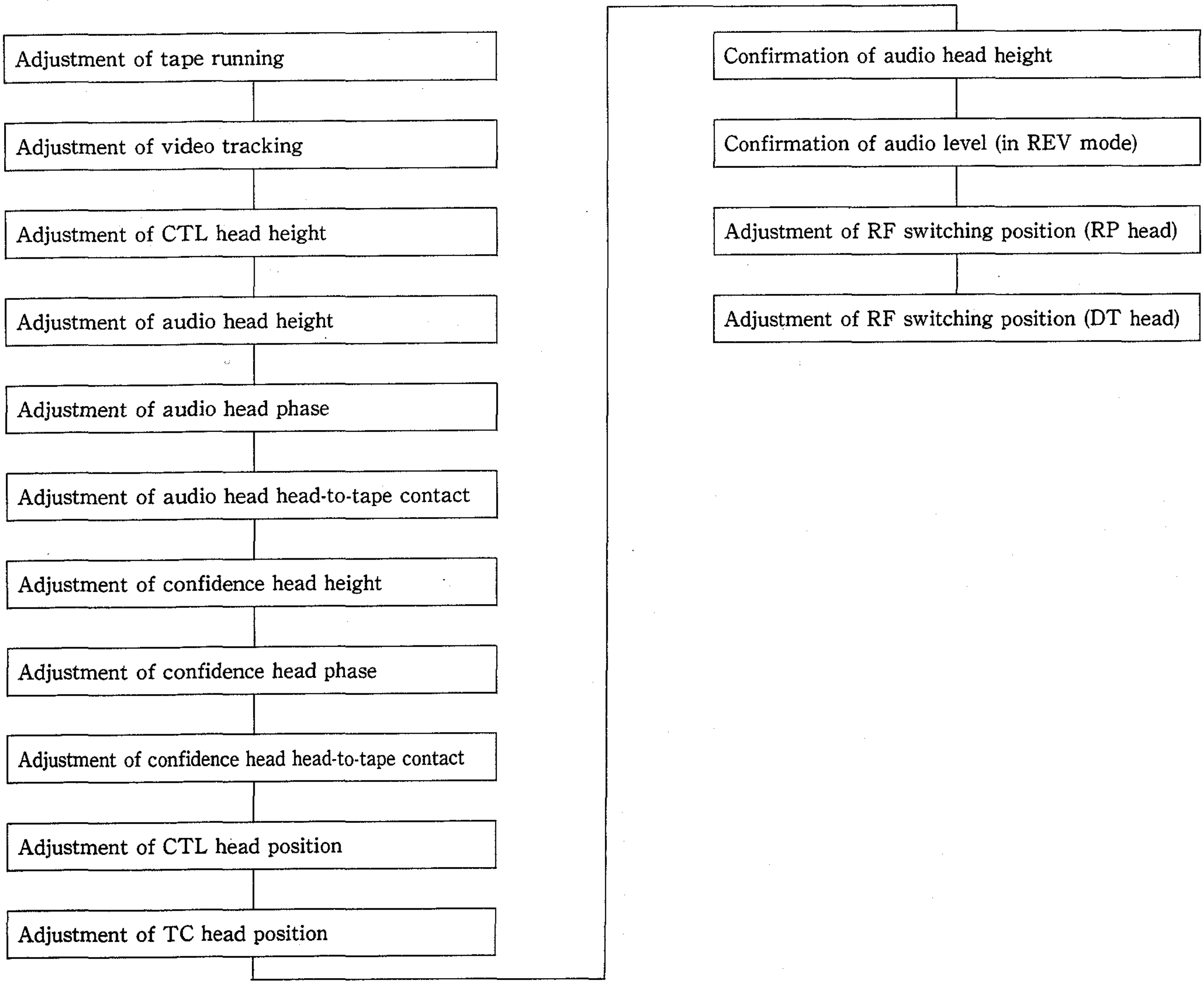
5-4. TAPE RUNNING ADJUSTMENT

- Adjustment of tape run is extremely important and critical adjustment for the purpose of running the tape in the most appropriate state. If this adjustment is not adequate, there is a possibility to damage the tape or cause serious damage to the unit.
  Take utmost care in performing adjustment.
- Perform this adjustment with the cassette compartment installed in the unit. By this way, accurate adjustment will be possible without difficulty as a service operation.

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Tape guide adjustment driver	: J-6321-500-A
Adjustment mirror	: J-6080-029-A
Oxide tape without lid (BCT-30G)	
Metal tape without lid (BCT-90ML)	

Adjustment flow chart


Adjustment of tape running
Adjustment of video tracking
Adjustment of CTL head height
Adjustment of audio head height
Adjustment of audio head phase
Adjustment of audio head head-to-tape contact
Adjustment of confidence head height
Adjustment of confidence head phase
Adjustment of confidence head head-to-tape contact
Adjustment of CTL head position
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio level (in REV mode)
Adjustment of RF switching position (RP head)
Adjustment of RF switching position (DT head)

Check

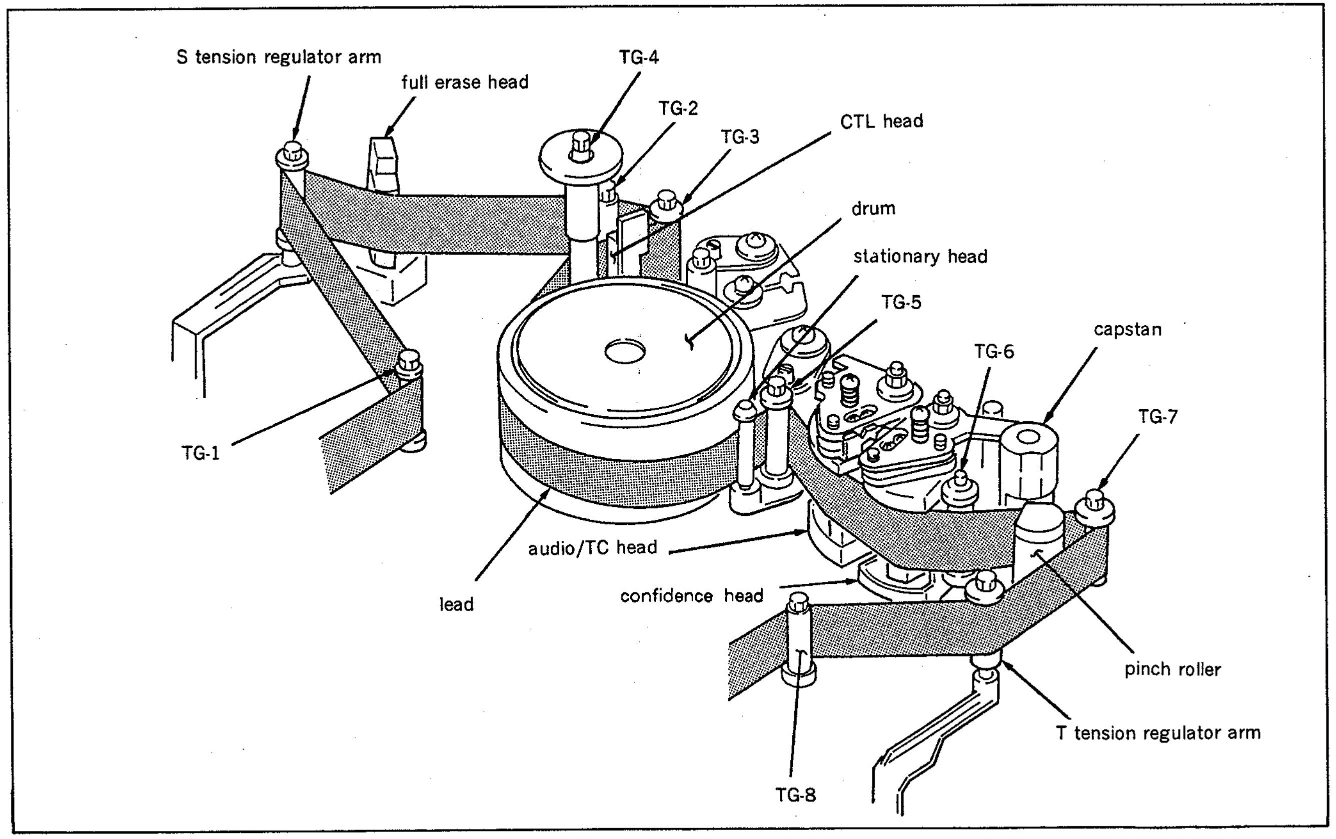
1. Clean the tape running surface of the tape guides, drum and video heads with a cleaning piece moistened with cleaning fluid.
2. Insert an oxide tape without lid (BCT-30G) into the unit.
3. Put the unit into PLAY mode.
4. Make sure using the adjustment mirror that the tape running condition satisfies the specification.
5. Put the unit into REV ×1 mode.
6. Make sure using the adjustment mirror that the tape running condition satisfies the specification.
7. Put the unit into FWD ×5 and F.FWD modes.
8. Make sure using the adjustment mirror that the tape running condition satisfies the specification.
9. Put the unit into REV ×5 and REW modes.
10. Make sure using the adjustment mirror that the tape running condition satisfies the specification.
11. Make sure that the specification is satisfied when the unit is changed from STOP mode to F.FWD mode, STOP mode to REW mode, STOP mode to PLAY mode, STOP mode to FWD ×5 mode, or STOP mode to REV ×5 mode.
12. Press the EJECT button, take out the oxide tape without lid (BCT-30G), and insert the metal particle tape without lid (BCT-90ML) into the unit.
13. Perform steps (3) through (11) and confirm that the specifications are satisfied.

Adjustment

14. Loosen the locking screw at the upper part of the tape guide that does not satisfy the specification two to three turns using the tape guide adjustment driver.
15. Turn the adjustment nut or the upper flange of the tape guide, and adjust the height of the tape guide so that the specification is satisfied. Tighten the locking screw after adjustment is completed.

Note :The specification may not be satisfied by the above adjustment when an S slider assembly or T slider assembly is replaced. In this case, turn the slantness adjustment screw for the S slider assembly or T slider assembly in accordance with the procedure described in the video tracking adjustment. (Refer to Section 5-5-2 or 5-5-3.)

16. Perform video tracking adjustment.
    (Refer to Section 5-5.)
17. Perform CTL head height adjustment.
    (Refer to Section 5-6.)
18. Perform audio head height adjustment.
    (Refer to Section 5-8.)
19. Perform audio head phase adjustment.
    (Refer to Section 5-9.)
20. Perform audio head head-to-tape contact adjustment.
    (Refer to Section 5-10.)



21. Perform confidence head height adjustment.
    (Refer to Section 5-11.)
22. Perform confidence head phase adjustment.
    (Refer to Section 5-12.)
23. Perform confidence head head-to-tape contact adjustment. (Refer to Section 5-13.)
24. Perform CTL head position adjustment.
    (Refer to Section 5-7.)
25. Perform TC head position adjustment.
    (Refer to Section 5-14.)
26. Perform reconfirmation of audio head height.
    (Refer to steps (1) through (3) in Section 5-8.)
27. Perform confirmation of audio level (in REV mode).
    (Refer to steps (1) through (4) in Section 5-15.)
28. Perform RF switching position (RP head) adjustment.
    (Refer to Section 5-16.)
29. Perform RF switching position (DT head) adjustment.
    (Refer to Section 5-17.)

Specification

Drum entrance side

1) The tape runs in contact with the lead of drum entrance side without any curl.
2) The upper edge of the tape runs in contact with the upper flange of the TG-3 tape guide.
   (If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
3) The lower edge of the tape runs in contact with the lower flange of the TG-2 tape guide.
   When the unit just put into the REV mode, the lower edge of the tape runs in contact with the lower flange without curl.
   (If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
4) The tape runs in the center of the guide roller of the S tension arm.
   (In modes other than PLAY, if a tape curl exists at the upper or lower flange, it is acceptable to the extent of 1/10 of the tape width.)
5) There shall be no uneven tape tension in the area between the TG-4 and TG-3, the TG-2 and full erase head, the full erase head and guide roller of S tension arm, and the guide roller of S tension arm and TG-1.

Drum exit side

6) The tape runs in contact with the lead of drum exit side without any curl.
7) The upper edge of the tape runs in contact with the upper flange of the TG-5 tape guide.
   (If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
8) The lower edge of the tape runs in contact with the lower flange of the TG-6 tape guide.
   However, in PLAY, F.FWD, and REW modes, the lower flange of the tape guide must not rotate.
   (If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
9) The upper edge of the tape runs in contact with the upper flange of the TG-7 tape guide.
   (If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
10) The tape runs in the center of the guide roller of the T tension arm.
    (In modes other than PLAY, if a tape curl exists at the upper or lower flange, it is acceptable to the extent of 1/10 of the tape width.)
11) There shall be no uneven tape tension in the area between the TG-5 and TG-6, the TG-6 and capstan shaft, the capstan shaft and TG-7, the TG-7 and guide roller of T tension arm, and the guide roller of T tension arm and TG-8.

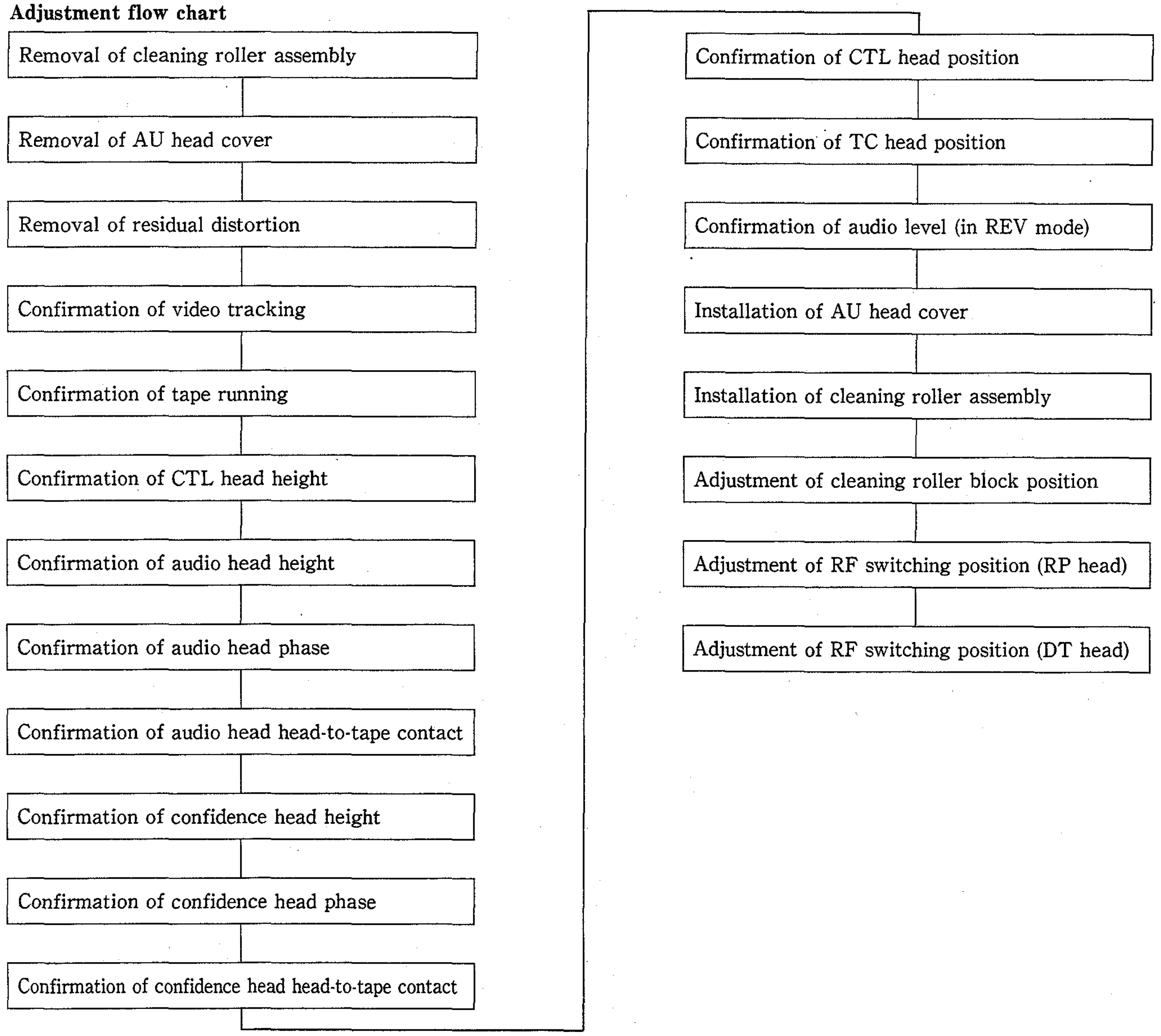
5-5. CONFIRMATION OF VIDEO TRACKING

- Adjustment of video tracking is extremely important. If this adjustment is not adequate, the tape interchangeability is influenced significantly.
  Take utmost care in performing adjustment.
- Perform this adjustment with the cassette compartment installed in the unit. By this way, accurate adjustment will be possible without difficulty as a service operation.

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Alignment tape without lid (CR2-1B PS)	: 8-960-096-51
Adjustment mirror	: J-6080-029-A
Dualtrace oscilloscope	

Adjustment flow chart

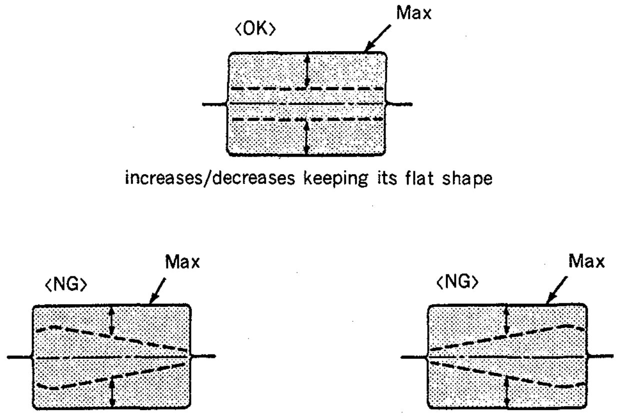

Removal of cleaning roller assembly
Removal of AU head cover
Removal of residual distortion
Confirmation of video tracking
Confirmation of tape running
Confirmation of CTL head height
Confirmation of audio head height
Confirmation of audio head phase
Confirmation of audio head head-to-tape contact
Confirmation of confidence head height
Confirmation of confidence head phase
Confirmation of confidence head head-to-tape contact
Confirmation of CTL head position
Confirmation of TC head position
Confirmation of audio level (in REV mode)
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position
Adjustment of RF switching position (RP head)
Adjustment of RF switching position (DT head)

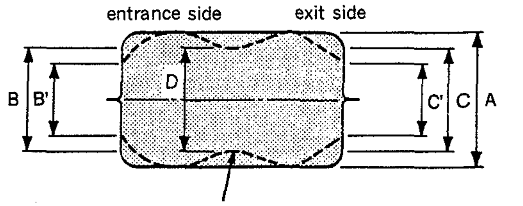
Preparation

1. Remove a cleaning roller assembly. (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover. (Refer to step (3) in Section 4-3.)

Check

1. Clean the tape running surface of the tape guides, drum, and video heads with a cleaning piece moistened with cleaning fluid.
2. Remove residual distortion from DT head. (Refer to item 5 in Section 5-1 "Required operation to remove residual distortion from DT head before attempting vides tracking adjustment.)
3. Select the DT SELECT switch on the front panel to OFF state.
4. Connect the oscilloscope as follows.
   CH-1 : TP803/AFM-8 board
   (Address : Side A, C-1) (Y-RF signal)
   CH-2 : TP701/AFM-8 board
   (Address : Side A, B-1) (Switching pulse)
   TRIG : CH-2
5. Insert an alignment tape without lid (CR2-1B PS) into the unit and put the unit into PLAY mode.
6. Make sure that the RF envelope waveform increases/decreases keeping its flat shape when the tracking control is turned.
7. Make sure that the head-to-tape contact waveform and fluctuation satisfy the required specifications when the RF envelope waveform is maximized.
8. Select the DT SELECT switch to VAR state.
9. Make sure that the head-to-tape contact waveform and fluctuation satisfy the required specifications.
10. Return the DT SELECT switch to OFF state.


〈OK〉
Max
increases/decreases keeping its flat shape
〈NG〉
Max
〈NG〉
Max


entrance side
exit side
B
B'
D
C'
C
A

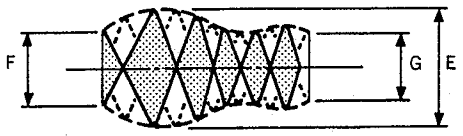
deterioration of RF waveform because of fluctuation

A : maximum output level
D : minimum output level at center portion because of fluctuation
C, B : maximum output level at entrance and exit sides
C', B' : minimum output level at entrance and exit sides because of fluctuation

$$\frac{B}{A} \geqq 0.8$$
$$\frac{C}{A} \geqq 0.8$$
$$\frac{D}{A} \geqq 0.9$$
$$\frac{B'}{B} \geqq 0.9$$
$$\frac{C'}{C} \geqq 0.9$$

11. Put the unit into REV ×1 mode.
12. Make sure that the head-to-tape contact waveform satisfies the specifications when the RF envelope waveform is maximized.
13. Select the DT SELECT switch to VAR state.
14. Make sure that the head-to-tape contact waveform in REV×1 mode satisfy the required specification.
15. Return the DT SELECT switch to OFF state.
16. Put the unit into REW and F.FWD modes, and change the mode from STOP to F.FWD modes, and from STOP to REW modes. At that time, make sure that no head-to-tape contact waveform lacking exists in the RF envelope waveform.
    If the specification is satisfied, perform steps (17) and later.
    If the specification is not satisfied, perform the adjustment in accordance with Sections 5-5-1, 5-5-2, or 5-5-3.
17. Make sure that the tape running state in each tape guide satisfy the specification.
    (Refer to steps (1) through (13) in Section 5-4.)
18. Perform confirmation of CTL head height.
    (Refer to steps (1) through (3) in Section 5-6.)
19. Perform confirmation of audio head height .
    (Refer to steps (1) through (3) in Section 5-8.)
20. Perform confirmation of audio head phase.
    (Refer to steps (1) through (4) in Section 5-9.)
21. Perform confirmation of audio head head-to-tape contact.
    (Refer to steps (1) through (4) in Section 5-10.)
22. Perform confirmation of confidence head height. (Refer to steps (1) through (4) in Section 5-11.)
23. Perform confirmation of confidence head phase. (Refer to steps (1) through (5) in Section 5-12.)
24. Perform confirmation of confidence head head-to-tape contact. (Refer to steps (1) through (5) in Section 5-13.)
25. Perform confirmation of CTL head position .
    (Refer to steps (1) through (4) in Section 5-7.)
26. Perform confirmation TC head position.
    (Refer to steps (1) through (3) in Section 5-14.)
27. Perform confirmation of audio level (in REV mode). (Refer to steps (1) through (4) in Section 5-15.)
28. Install the AU head cover. (Refer to step (31) in Section 4-3.)

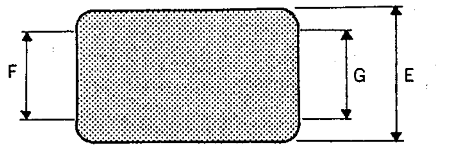
⟨In REV mode (DT OFF mode)⟩



Spec. : $\frac{F}{E} \geqq 0.8$

$\frac{G}{E} \geqq 0.8$

⟨in REV mode (DT VAR mode)⟩



Spec. : $\frac{F}{E} \geqq 0.8$

$\frac{G}{E} \geqq 0.8$

29. Install the cleaning roller assembly.
    (Refer to steps (7) and (8) in Section 4-6.)
30. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)
31. Perform RF switching position (RP head) adjustment. (Refer to Section 5-16.)
32. Perform RF switching position (DT head) adjustment. (Refer to Section 5-17.)

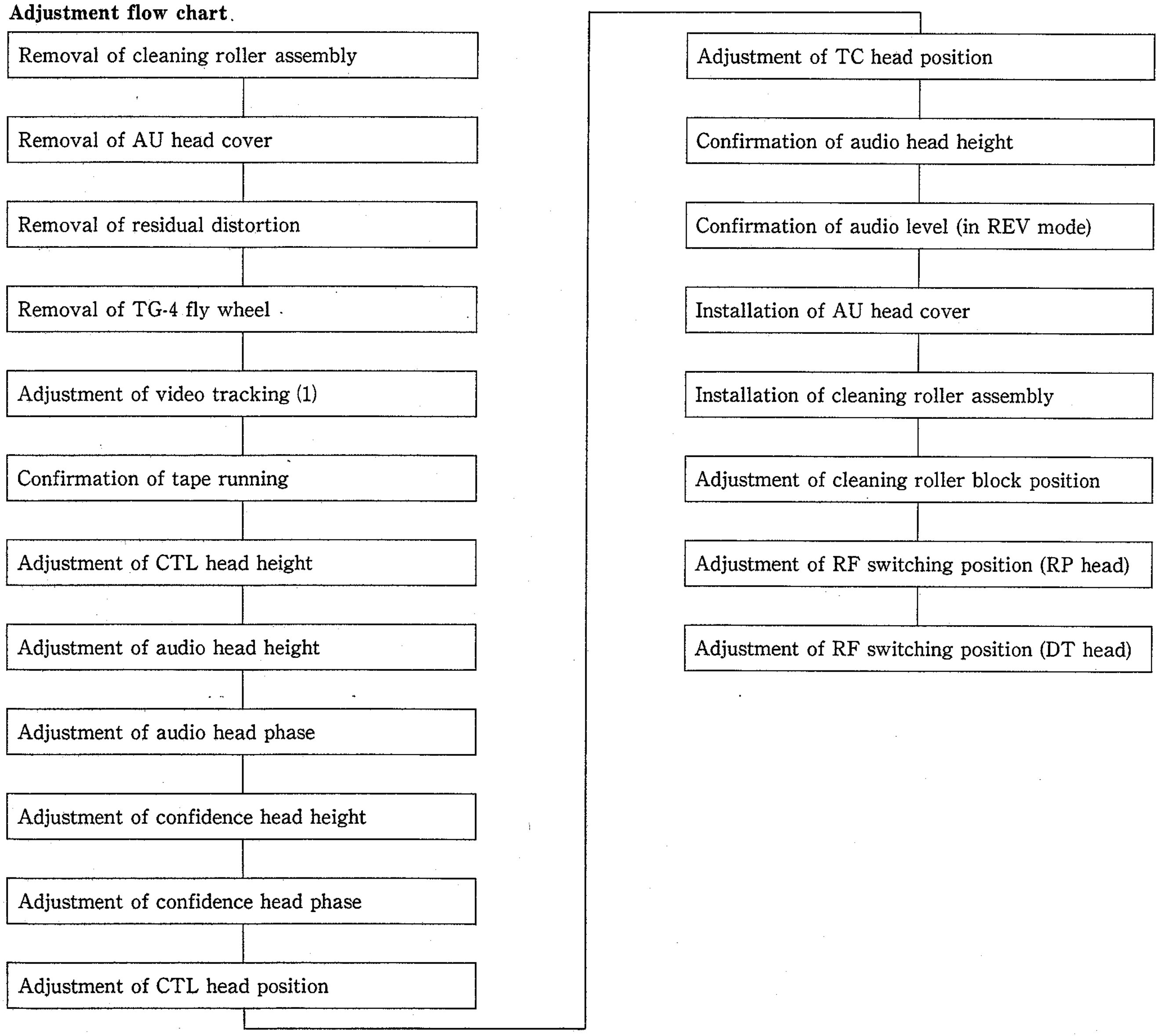
5-5-1. Video Tracking Adjustment (1)

- Adjustment of video tracking is extremely important. If this adjustment is not adequate, the tape interchangeability is influenced significantly.
  Take utmost care in performing adjustment.
- Perform this adjustment with the cassette compartment installed in the unit. By this way, accurate adjustment will be possible without difficulty as a service operation.

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Alignment tape without lid (CR2-1B PS)	: 8-960-096-51
Tape guide adjustment driver	: J-6321-500-A
Adjustment mirror	: J-6080-029-A
Dualtrace oscilloscope	

Adjustment flow chart.


Removal of cleaning roller assembly
Removal of AU head cover
Removal of residual distortion
Removal of TG-4 fly wheel
Adjustment of video tracking (1)
Confirmation of tape running
Adjustment of CTL head height
Adjustment of audio head height
Adjustment of audio head phase
Adjustment of confidence head height
Adjustment of confidence head phase
Adjustment of CTL head position
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio level (in REV mode)
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position
Adjustment of RF switching position (RP head)
Adjustment of RF switching position (DT head)

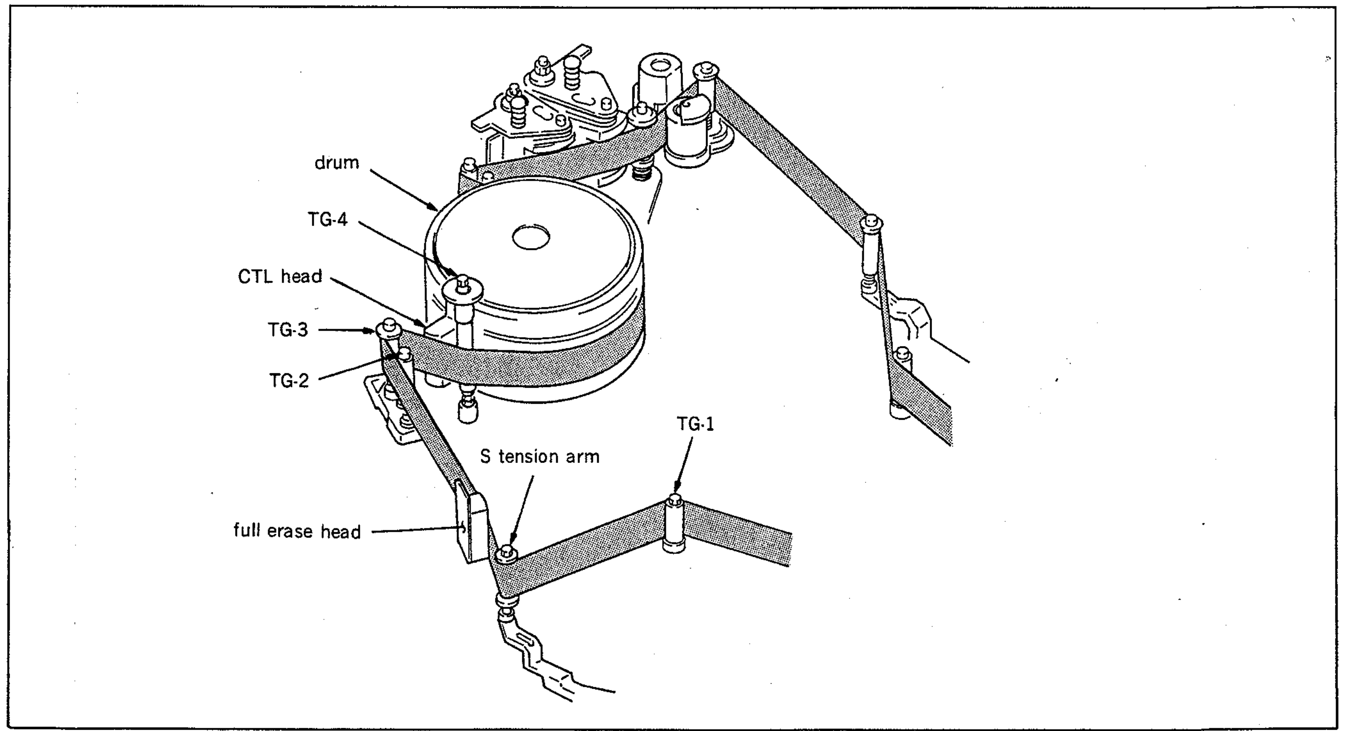
Preparation

1. Remove a cleaning roller assembly. (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover. (Refer to step (3) in Section 4-3.)
3. Set ITEM 913 of SETUP MENU to 1 (ON).
   (Refer to item 7 in Section 5-1 "Tracking control procedure in DT mode".)

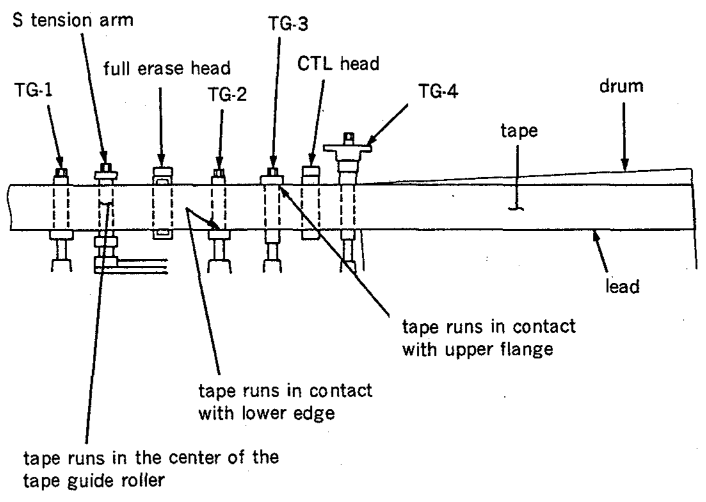
Adjustment

- **Perform steps (1) through (26), and steps (48) and later when performing the tracking adjustment on the drum entrance side.**
- **Perform steps (1) through (3), and steps (27) and later when performing the tracking adjustment on the drum exit side.**

1. Clean the tape running surface of the tape guides, drum, and video heads with a cleaning piece moistened with cleaning fluid.
2. Remove residual distortion from DT head. (Refer to item 5 in Section 5-1 "Required operation to remove residual distortion from DT head before attempting video tracking adjustment.)
3. Connect the oscilloscope as follows.
   CH-1 : TP803/AFM-8 board
   (Address : Side A, C-1) (Y-RF signal)
   CH-2 : TP701/AFM-8 board
   (Address : Side A, B-1) (Switching pulse)
   TRIG : CH-2
4. Hold claws of the upper part of a TG-4 tape guide roller using tweezers, and remove a fly wheel. (Refer to Section 4-2.)
5. Loosen the locking screws at the upper part of a TG-3 and TG-2 tape guide rollers one to two turns using a tape guide adjustment driver.
6. Confirm the DT SELECT switch on the front panel to OFF state.
7. Insert an alignment tape CR2-1B PS and put the unit into PLAY mode.
8. Turn the tracking control so that the RF envelope waveform is 70 % to 80 % of the maximum output.
9. Turn the adjustment nut of the TG-2 tape guide so that the lower flange of the TG-2 tape guide does not come in contact with the lower edge of the tape.
10. Turn the upper flange of the TG-3 tape guide so that the RF envelope waveform on the entrance side is flat.
11. Turn the adjustment nut of the TG-2 tape guide so that the lower flange of the TG-2 tape guide comes in contact with the lower edge of the tape.

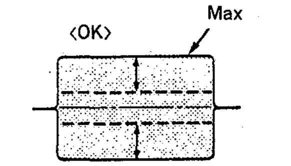

drum
TG-4
CTL head
TG-3
TG-2
TG-1
S tension arm
full erase head

12. Turn the tracking control so that the RF envelope waveform is the maximum output.
Make sure that the head-to-tape contact of the RF envelope waveform on the drum entrance side and the fluctuation satisfy the specification. Make sure that no tape curl to occur at the tape guide flanges of the TG-2 and TG-3 using an adjustment mirror.
(If tape curl can not be removed, it is acceptable as far as the maximum limit shown in the figure.)
13. Select the DT SELECT switch to VAR state.
14. Turn the search dial so that the RF envelope waveform is the maximum output.
Make sure that the head-to-tape contact of the RF envelope waveform on the drum entrance side and fluctuation satisfy the specification.
15. Return the DT SELECT switch to OFF state.
16. Reset ITEM 913 of SETUP MENU to 0 (OFF).
17. Perform the CTL head position tentative adjustment. (Refer to Section 5-7.)


S tension arm
TG-3
full erase head
CTL head
TG-1
TG-2
TG-4
drum
tape
lead
tape runs in contact with upper flange
tape runs in contact with lower edge
tape runs in the center of the tape guide roller

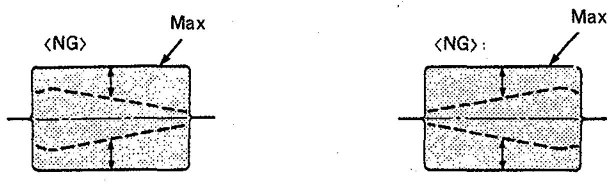
Specifications

- The upper edge of the tape runs in contact with the upper flange of the TG-3 tape guide.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The lower edge of the tape runs in contact with the lower flange of the TG-2 tape guide.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The tape runs in the center of the guide roller of the S tension arm.
(In modes other than PLAY, if a tape curl exists at the upper or lower flange, it is acceptable to the extent of 1/10 of the tape width.)



increases/decreases keeping its flat shape

A : maximum output level
D : minimum output level at center portion because of fluctuation
C, B : maximum output level at entrance and exit sides
C', B' : minimum output level at entrance and exit sides because of fluctuation



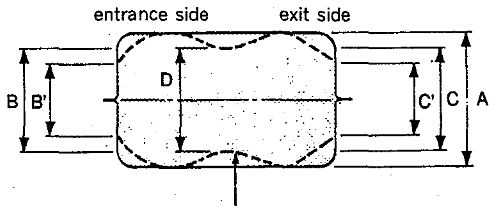
$\frac{B}{A} \geqq 0.8$

$\frac{C}{A} \geqq 0.8$

$\frac{D}{A} \geqq 0.9$

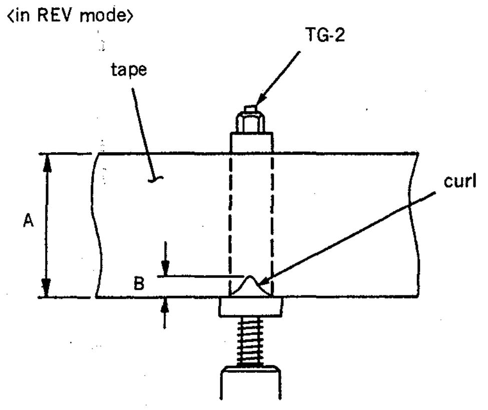
$\frac{B'}{B} \geqq 0.9$

$\frac{C'}{C} \geqq 0.9$



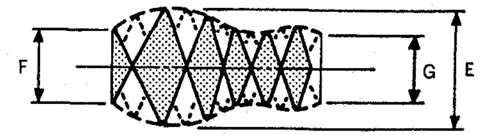
deterioration of RF waveform because of fluctuation

18. Put the unit into REV ×1 mode.
At that time, make sure that the tape curl at the lower flange of the TG-2 tape guide satisfies the specification below.
Specification : No tape curl to occur at the lower flange.
(If tape curl can not be removed, it is acceptable to the extent of 1/10 of the tape width.)
If the specification is not satisfied, perform the adjustment in accordance with the following procedure.
    1) Loosen the locking screw of the guide roller of the S tension regulator one to two turns using a tape guide adjustment driver.
    2) Put the unit into PLAY mode.
    3) Rotate the upper flange so that the tape runs in the center of the guide roller of the S tension regulator.
    4) Put the unit into REV ×1 mode.
    5) Turn the upper flange of the guide roller of the S tension regulator and adjustment nut of the TG-2 tape guide for fine adjustment so that the specification is satisfied.
    6) Put the unit into PLAY mode again. Make sure that the head-to-tape contact of the RF envelope waveform and fluctuation satisfy the specification, and that the tape running at the TG-2 tape guide and guide roller of the S tension regulator satisfy the specification described on the right column.
    If the specification is not satisfied, readjust repeatedly so that the specification is satisfied in both PLAY and REV modes.
19. Put the unit into REV ×1 mode and turn the tracking control so that the RF envelope waveform is the maximum output.
20. Make sure that the head-to-tape contact of the RF envelope waveform in REV ×1 mode satisfies the specification.
21. Select the DT SELECT switch to VAR state.
22. Make sure that the head-to-tape contact of the RF envelope waveform in REV×1 mode satisfies the specification.
23. Return the DT SELECT switch to OFF state.
24. Tighten the locking screws of each tape guide using a tape guide adjustment driver.



$\frac{B}{A} \leqq \frac{1}{10}$

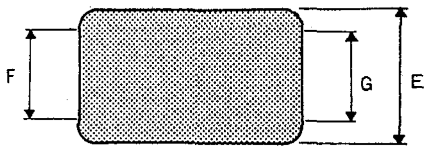
‹in REV mode (DT OFF state)›



Spec. : $\frac{F}{E} \geqq 0.8$

$\frac{G}{E} \geqq 0.8$

‹in REV mode (DT VAR mode)›



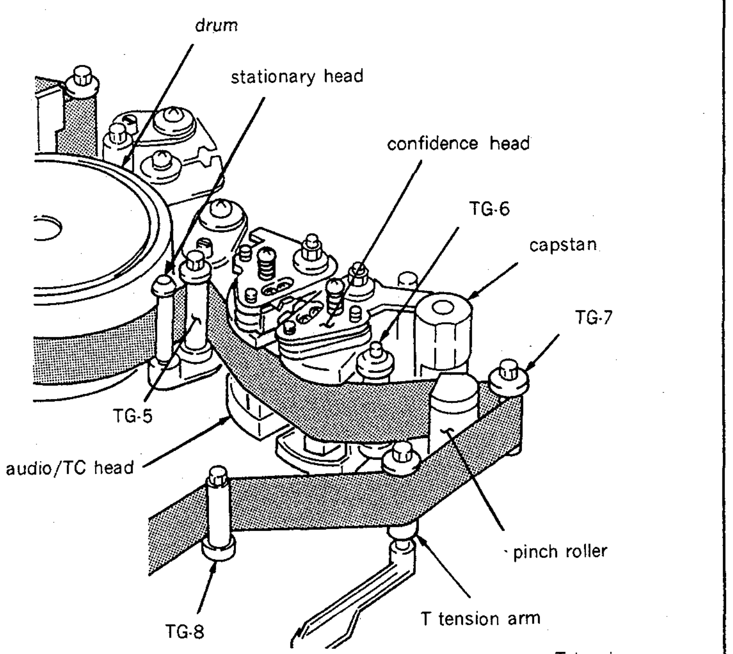
Spec. : $\frac{F}{E} \geqq 0.8$

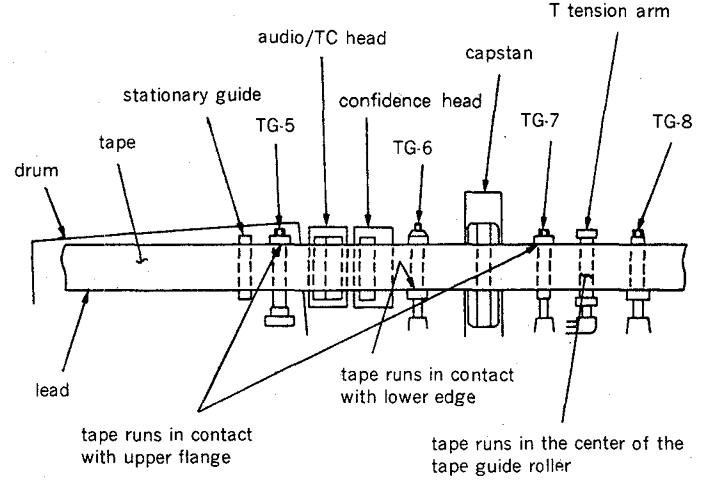
$\frac{G}{E} \geqq 0.8$

25. Perform steps (6) through (16) in Section 5-5, and make sure that the head-to-tape contact of the RF envelope waveform and fluctuation satisfy the specification.
26. Install the fly wheel to the TG-4 tape guide roller. Make sure that the fly wheel is surely locked, after installation.
If the RF envelope waveform on the drum entrance side and tape running do not satisfy the specification even in the above procedure, replace the drum assembly.

Steps (27) and later describe the tracking adjustment on the drum exit side.

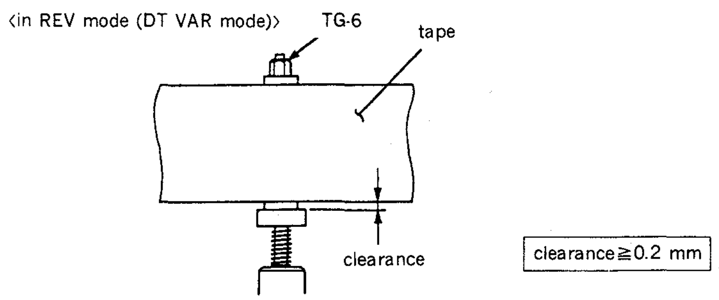
27. Set ITEM 913 of SETUP MENU to 1 (ON).
28. Loosen the locking screws at the upper part of the TG-5, TG-6, and TG-7 tape guide rollers one to two turns using a tape guide adjustment driver.
29. Insert the alignment tape CR2-1B PS and put the unit into PLAY mode.
30. Turn the tracking control so that the RF envelope waveform is 70% to 80% of the maximum output.
31. Turn the adjustment nut of the TG-6 tape guide so that the lower flange of the TG-6 tape guide does not come in contact with the lower edge of the tape.
32. Turn the upper flange of the TG-7 tape guide so that the upper flange of the tape guide does not come in contact with the upper edge of the tape.
33. Turn the upper flange of the TG-5 tape guide so that the RF envelope waveform on the exit side is flat.
If tape curl can not be removed in the upper flange of the TG-5 tape guide when the RF envelope waveform is flat, make sure that the zenith of an audio/TC head.
(Refer to Section 5-3.)
34. Turn the adjustment nut of the TG-6 tape guide so that the lower flange of the TG-6 tape guide comes in contact with the lower edge of the tape.

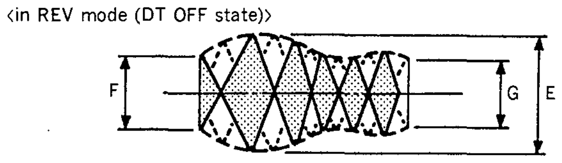

drum
stationary head
confidence head
TG-6
capstan
TG-7
TG-5
audio/TC head
pinch roller
TG-8
T tension arm


T tension arm
audio/TC head
capstan
stationary guide
confidence head
TG-5
TG-7
TG-8
tape
TG-6
drum
lead
tape runs in contact with lower edge
tape runs in contact with upper flange
tape runs in the center of the tape guide roller

- The upper edge of the tape runs in contact with the upper flange of the TG-5 tape guide.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The lower edge of the tape runs in contact with the lower flange of the TG-6 tape guide.
However, in PLAY, F.FWD, and REW modes, the lower flange of the tape guide must not rotate.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The upper edge of the tape runs in contact with the upper flange of the TG-7 tape guide.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The tape runs in the center of the guide roller of the T tension arm.
(In modes other than PLAY, if a tape curl exists at the upper or lower flange, it is acceptable to the extent of 1/10 of the tape width.)

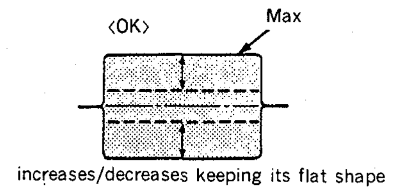
35. Press REW button, and put the unit into REW mode.
At that time, make sure that the clearance between the lower flange of the TG-6 tape guide and tape satisfies the specification.
Specification : The clearance between the lower flange and lower edge of the tape should be more than 0.2 mm.
If not to meet the specification, fine adjust the tape guide in PLAY and REW modes repeatedly.
36. Put the unit into PLAY mode, turn the upper flange of the TG-7 tape guide so that the upper flange of the TG-7 tape guide slightly comes in contact with the upper edge of the tape.
37. Turn the tracking control so that the RF envelope waveform is the maximum output.
Make sure that the head-to-tape contact of the RF envelope waveform on the drum exit side and the fluctuation satisfy the specification.
Make sure that no tape curl to occur at the tape guide flanges of the TG-5, TG-6 and TG-7 using the adjustment mirror.
(If tape curl can not be removed, it is acceptable as far as the maximum limit shown in the figure.)
38. Select the DT SELECT switch to VAR state.
39. When the search dial is STILL position, make sure that the head-to-tape contact of the RF envelope waveform on the drum exit side and the fluctuation satisfy the specification.
40. Return the DT SELECT switch to OFF state.
41. Reset ITEM 913 of SETUP MENU to 1(ON).
42. Put the unit into REV × 1 mode, make sure that the head-to-tape contact of the RF envelope waveform in REV × 1 mode satisfies the specification.
43. Select the DT SELECT switch to VAR state.
44. Put the unit into DT REV× 1 mode, make sure that the head-to-tape contact of the RF envelope waveform in this mode satisfies the specification.
45. Return the DT SELECT switch to OFF state.
46. Tighten the locking screws of each tape guide using a tape guide adjustment driver.

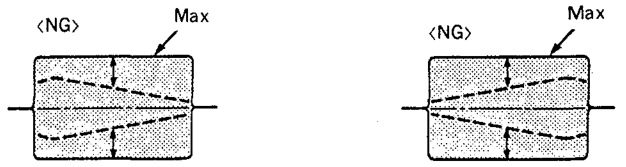

⟨in REV mode (DT VAR mode)⟩
TG-6
tape
clearance
clearance≧0.2 mm

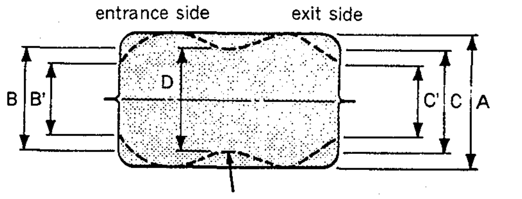

⟨in REV mode (DT OFF state)⟩
F
G
E

$\frac{F}{E} \geqq 0.8$

$\frac{G}{E} \geqq 0.8$


⟨OK⟩
Max
increases/decreases keeping its flat shape


⟨NG⟩
Max
⟨NG⟩
Max


entrance side
exit side
B
B'
D
C'
C
A
deterioration of RF waveform because of fluctuation

A : maximum output level
D : minimum output level at center portion because of fluctuation
C, B : maximum output level at entrance and exit sides
C', B' : minimum output level at entrance and exit sides because of fluctuation

$\frac{B}{A} \geqq 0.8$

$\frac{C}{A} \geqq 0.8$

$\frac{D}{A} \geqq 0.9$

$\frac{B'}{B} \geqq 0.9$

$\frac{C'}{C} \geqq 0.9$

47. Perform steps (6) through (16) in Section 5-5, and make sure that the head-to-tape contact of the RF envelope waveform and fluctuation satisfy the specification.

    If the RF envelope waveform on the drum exit side and the tape running do not satisfy the specification even in the above procedure, replace the drum assembly.
48. Make sure that the tape running at each tape guide satisfy the specification.
    (Refer to steps (1) through (13) in Section 5-4.)
49. Perform CTL head height adjustment.
    (Refer to Section 5-6.)
50. Perform audio head height adjustment.
    (Refer to Section 5-8.)
51. Perform audio head phase adjustment.
    (Refer to Section 5-9.)
52. Perform confidence head height adjustment.
    (Refer to Section 5-11.)
53. Perform confidence head phase adjustment.
    (Refer to Section 5-12.)
54. Perform CTL head position adjustment.
    (Refer to Section 5-7.)
55. Perform TC head position adjustment.
    (Refer to Section 5-14.)
56. Perform reconfirmation of audio head height.
    (Refer to steps (1) through (3) in Section 5-8.)
57. Perform confirmation of audio level (in REV mode). (Refer to steps (1) through (4) in Section 5-15.)
58. Install the AU head cover.
    (Refer to step (31) in Section 4-3.)
59. Install the cleaning roller assembly.
    (Refer to steps (7) and (8) in Section 4-6.)
60. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)
61. Perform RF switching position (RP head) adjustment. (Refer to Section 5-16.)
62. Perform RF switching position (DT head) adjustment. (Refer to Section 5-17.)

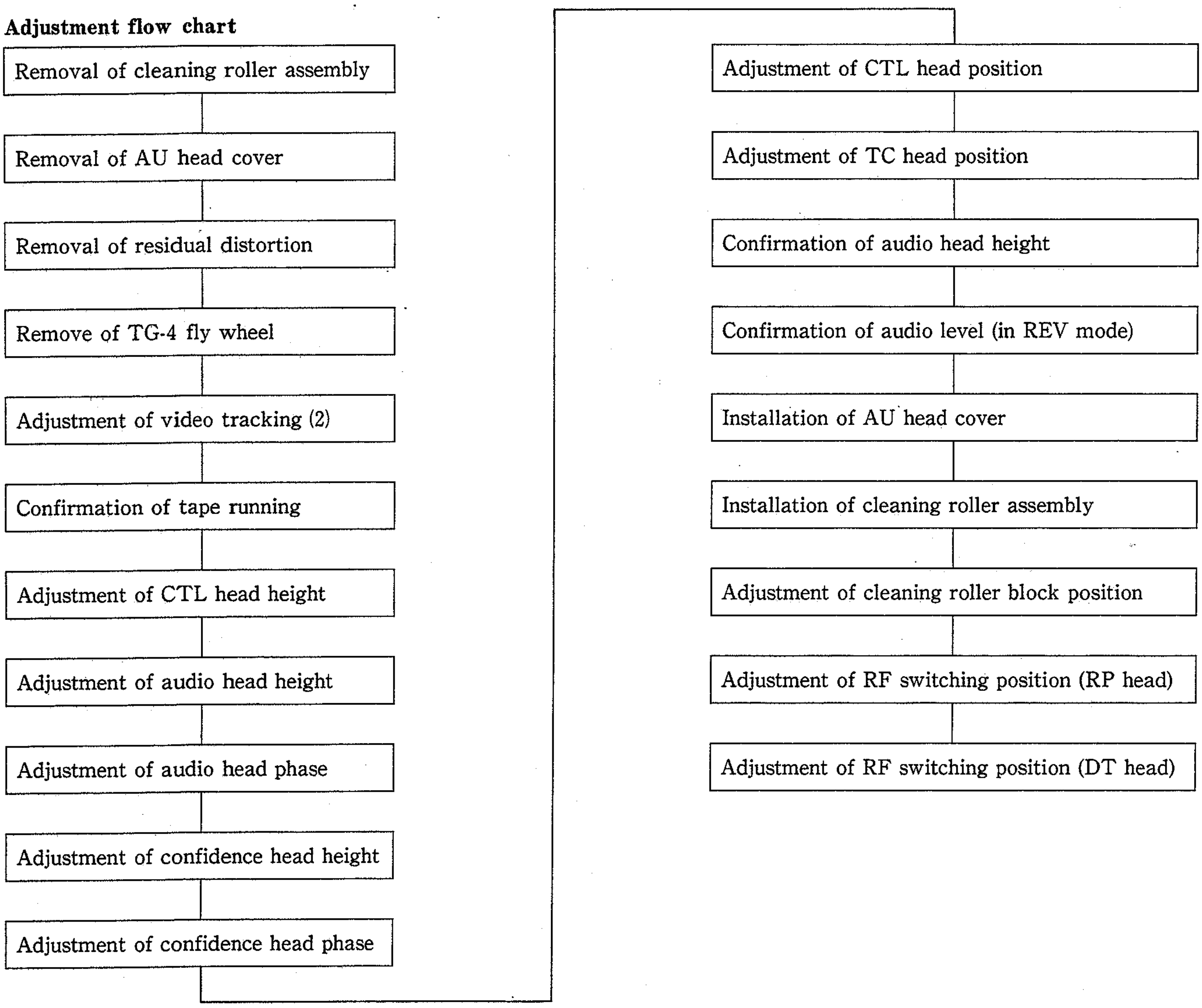
5-5-2. Video Tracking Adjustment (2)

- This section describes how to adjust the video tracking when an S slider assembly is replaced.
- Adjustment of video tracking is extremely important. If this adjustment is not adequate, the tape interchangeability is influenced significantly.
  Take utmost care in performing adjustment.
- Perform this adjustment with the cassette compartment installed in the unit. By this way, accurate adjustment will be possible without difficulty as a service operation.

Tools

Cleaning piece : 2-034-697-00
Cleaning fluid : 9-919-573-01
Alignment tape without lid (CR2-1B PS) : 8-960-096-51
Tape guide adjustment driver : J-6321-500-A
Adjustment mirror : J-6080-029-A
Dualtrace oscilloscope

Adjustment flow chart

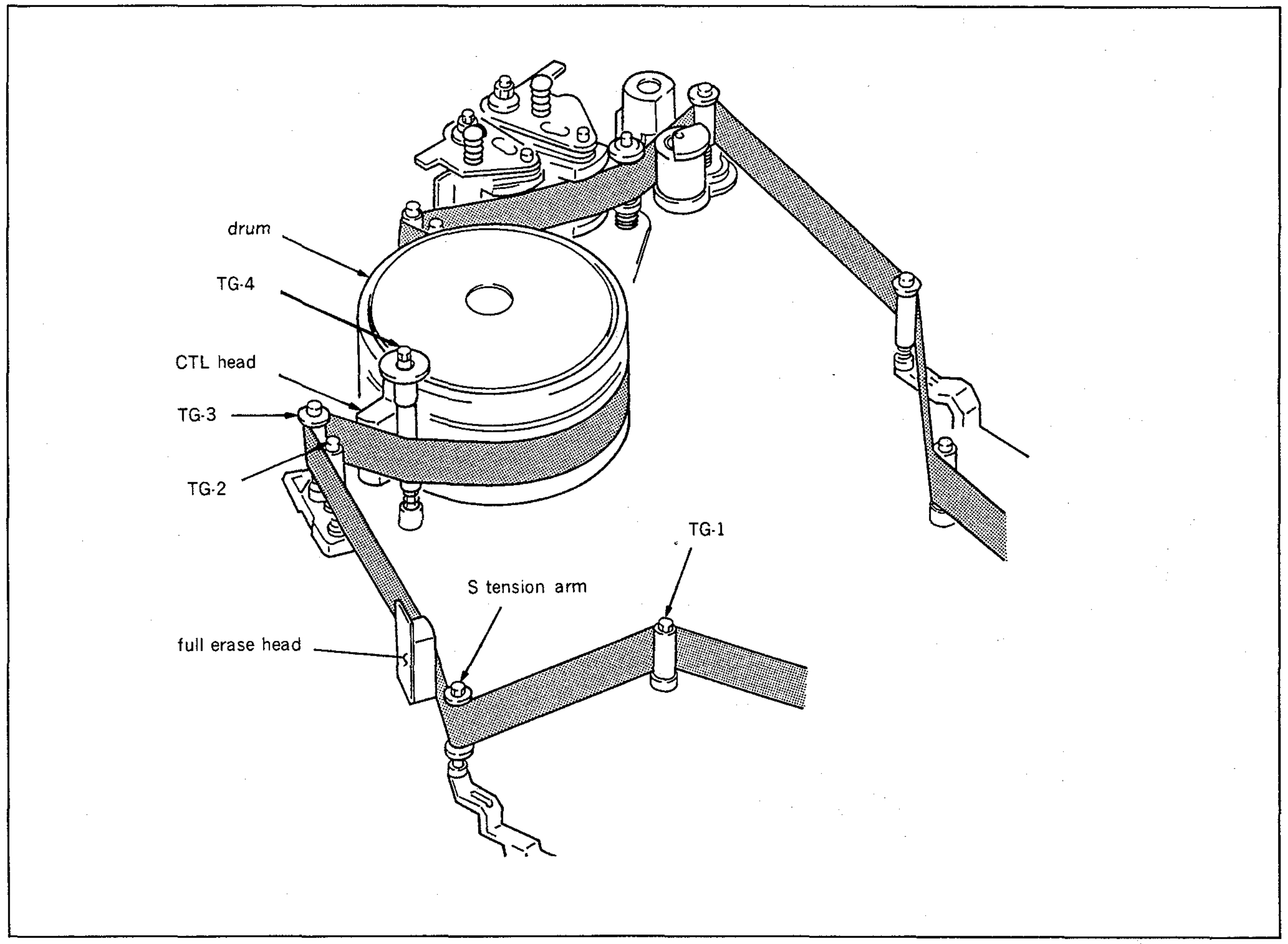

Removal of cleaning roller assembly
Removal of AU head cover
Removal of residual distortion
Remove of TG-4 fly wheel
Adjustment of video tracking (2)
Confirmation of tape running
Adjustment of CTL head height
Adjustment of audio head height
Adjustment of audio head phase
Adjustment of confidence head height
Adjustment of confidence head phase
Adjustment of CTL head position
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio level (in REV mode)
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position
Adjustment of RF switching position (RP head)
Adjustment of RF switching position (DT head)

Preparation

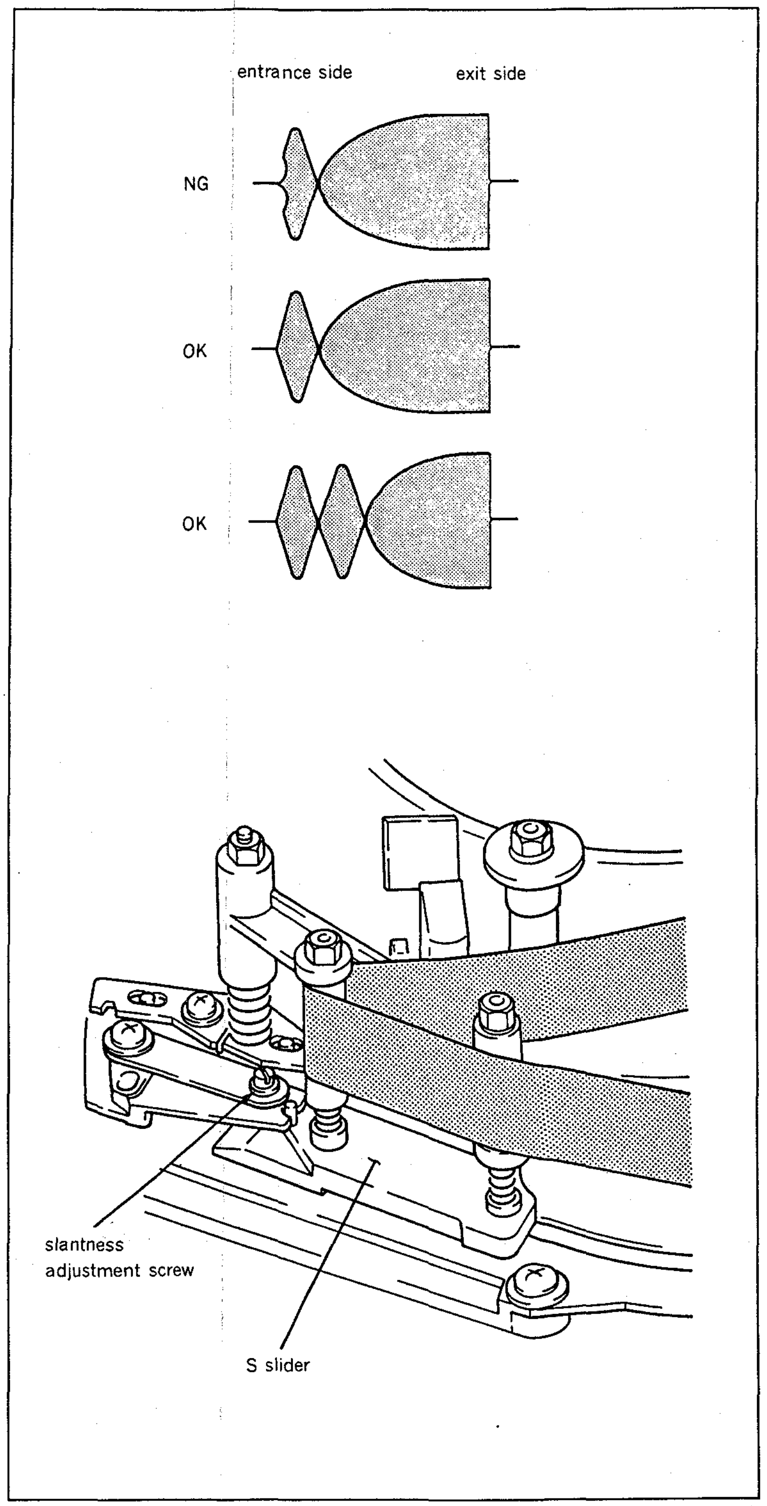
1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-6.)
3. Set ITEM 913 of SETUP MENU to 1 (ON).
   (Refer to item 7 in Section 5-1 "Tracking control procedure in DT mode".)

Adjustment

1. Hold claws of the upper part of a TG-4 tape guide roller using tweezers, and remove a fly wheel. (Refer to Section 4-2.)
2. Clean the tape running surface of the tape guides, drum, and video heads with a cleaning piece moistened with cleaning fluid.
3. Remove residual distortion from DT head.
   (Refer to item 5 in Section 5-1 "Required operation to remove residual distortion from DT head before attempting video tracking adjustment.)



4. Connect the oscilloscope as follows.
   CH-1 : TP803/AFM-8 board
   (Address : Side A, C-1) (Y-RF signal)
   CH-2 : TP701/AFM-8 board
   (Address : Side A, B-1) (Switching pulse)
   TRIG : CH-2
5. Loosen the locking screws at the upper part of a TG-3 tape guide roller, TG-2 tape guide roller and S tension arm one to two turns using a tape guide adjustment driver.
6. Select the DT SELECT switch on the front panel to OFF state.
7. Insert an alignment tape CR2-1B PS and put the unit into PLAY mode.
8. Turn the adjustment nut of the TG-2 tape guide so that a clearance occurs between the lower flange of the TG-2 tape guide and the lower edge of the tape.
9. Turn the upper flange of the TG-3 tape guide so that a clearance occurs between the upper flange of the TG-3 tape guide and the upper edge of the tape.
10. Fine adjust the height of the tape guide of the S tension arm so that the tape runs in the center of the tape guide of the S tension arm.
11. Make sure that the tape does not run in contact with the tape guide flanges of the TG-2, TG-3, TG-4, and S tension arm.
12. Turn the tracking control so that the RF envelope waveform on the drum exit side is maximum.
13. Make sure that the RF waveform satisfies the specification as shown in the figure.
    If the specification is not satisfied, perform the adjustment as follows :
    1) Turn the slantness adjustment screw for an S slider assembly in counterclockwise in the range not exceeding 90 degrees to satisfy the specification.
14. Turn the upper flange of the TG-3 tape guide so that it comes in contact with the upper edge of the tape and so that the RF envelope waveform is flat.
15. Turn the tracking control so that the RF envelope waveform is 70% to 80% of the maximum output.
16. Turn the adjustment nut of the TG-2 tape guide so that the lower flange of the TG-2 tape guide comes in contact with the lower edge of the tape.



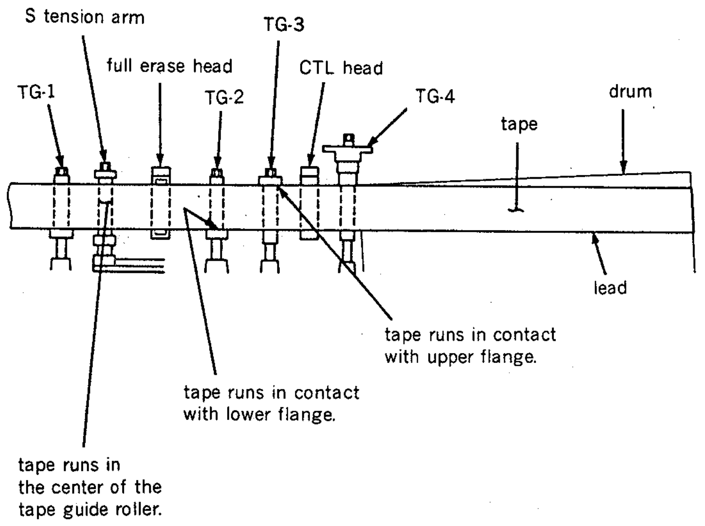
17. Fine adjust the height of the tape guide of the S tension arm so that the tape runs in the center of the tape guide of the S tension arm.
18. Turn the tracking control so that the RF envelope waveform is the maximum output. Make sure that the head-to-tape contact of the RF envelope waveform on the drum entrance side and fluctuation satisfy the specification.
    Make sure that no tape curl to occur at the tape guide flanges of the TG-2 and TG-3 using an adjustment mirror.
    (If tape curl can not be removed, it is acceptable as far as the maximum limit shown in the figure.)
19. Select the DT SELECT switch to VAR state.
20. Turn the search dial so that the RF envelope waveform is the maximum output.
    Make sure that the head-to-tape contact of the RF envelope waveform on the drum entrance side and fluctuation satisfy the specification.
21. Return the DT SELECT switch to OFF state.
22. Reset ITEM 913 of SETUP MENU to 0 (OFF).
23. Put the unit into REV ×1 mode.
    At that time, make sure that the tape curl at the lower flange of the TG-2 tape guide satisfies the specification below.

Specification : No tape curl to occur at the lower flange.
(If tape curl can not be removed, it is acceptable to the extent of 1/10 of the tape width.)

If the specification is not satisfied, perform the adjustment in accordance with the following procedure.

1) Put the unit into REV ×1 mode.
2) Turn the upper flange of the guide roller of the S tension arm and adjustment nut of the TG-2 tape guide for fine adjustment so that the specification is satisfied.

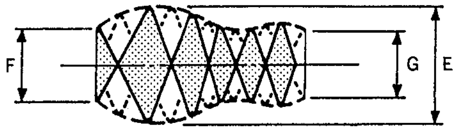
- The upper edge of the tape runs in contact with the upper flange of the TG-3 tape guide.
  (If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The lower edge of the tape runs in contact with the lower flange of the TG-2 tape guide.
  (If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The tape runs in the center of the guide roller of the S tension arm.
  (In modes other than PLAY, if a tape curl exists at the upper or lower flange, it is acceptable to the extent of 1/10 of the tape width.)


S tension arm
TG-3
full erase head
CTL head
TG-1
TG-2
TG-4
drum
tape
lead
tape runs in contact with upper flange.
tape runs in contact with lower flange.
tape runs in the center of the tape guide roller.

3) Put the unit into PLAY mode again. Make sure that the head-to-tape contact of the RF envelope waveform and fluctuation satisfy the specification, and that the tape running at the TG-2 tape guide and guide roller of the S tension arm satisfy the specification described on the right column.
   If the specification is not satisfied, readjust repeatedly so that the specification is satisfied in both PLAY and REV modes.

24. Put the unit into REV ×1 mode and make sure that the head-to-tape contact of the RF envelope waveform in REV ×1 mode satisfies the specification.
25. Set the DT SELECT switch to VAR state.
26. Put the unit into DT REV× 1 mode.
    Make sure that the head-to-tape contact of the RF envelope waveform satisfies the specification.
27. Reset the DT SELECT switch to OFF state.
28. Tighten the locking screws of each tape guide using a tape guide adjustment driver.
29. Perform steps (6) through ⒃ in Section 5-5, and make sure that the head-to-tape contact of the RF envelope waveform and fluctuation satisfy the specification.
30. Install the fly wheel to the TG-4 tape guide roller. Make sure that the fly wheel is surely locked, after installation.
31. Make sure that the tape running at each tape guide satisfy the specification.
    (Refer to steps (1) through ⒀ Section 5-4.)
32. Perform CTL head height adjustment.
    (Refer to Section 5-6.)
33. Perform audio head height adjustment.
    (Refer to Section 5-8.)
34. Perform audio head phase adjustment.
    (Refer to Section 5-9.)
35. Perform confidence head height adjustment.
    (Refer to Section 5-11.)
36. Perform confidence head phase adjustment.
    (Refer to Section 5-12.)
37. Perform CTL head position adjustment.
    (Refer to Section 5-7.)
38. Perform TC head position adjustment.
    (Refer to Section 5-14.)
39. Perform reconfirmation of audio head height.
    (Refer to steps (1) through (3) in Section 5-8.)
40. Perform confirmation of audio level (in REV mode). (Refer to steps (1) through (4) in Section 5-15.)

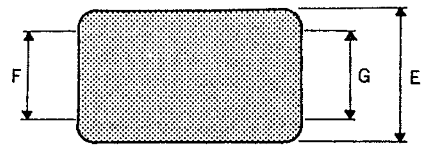
⟨in REV mode (DT OFF state)⟩



$\frac{F}{E} \geqq 0.8$

$\frac{G}{E} \geqq 0.8$

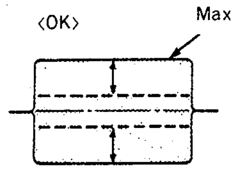
⟨in REV mode (DT VAR mode)⟩



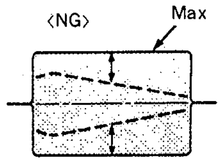
$\frac{F}{E} \geqq 0.8$

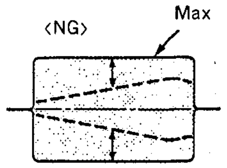
$\frac{G}{E} \geqq 0.8$

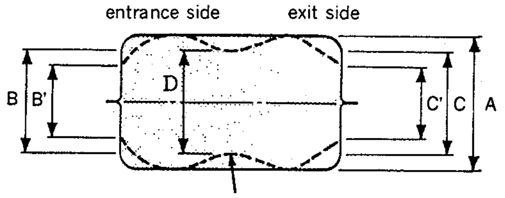
< in PLAY mode >



increases/decreases keeping its flat shape







deterioration of RF waveform because of fluctuation

A : maximum output level
D : minimum output level at center portion because of fluctuation
C, B : maximum output level at entrance and exit sides
C', B' : minimum output level at entrance and exit sides because of fluctuation

$\frac{B}{A} \geqq 0.8$ $\frac{C}{A} \geqq 0.8$ $\frac{D}{A} \geqq 0.9$ $\frac{B'}{B} \geqq 0.9$ $\frac{C'}{C} \geqq 0.9$

41. Install the AU head cover. (Refer to step ㉛ in Section 4-3.)
42. Install the cleaning roller assembly. (Refer to steps (7) and (8) in Section 4-6.)
43. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)
44. Perform RF switching position (RP head) adjustment. (Refer to Section 5-16.)
45. Perform RF switching position (DT head) adjustment. (Refer to Section 5-17.)

5-5-3. Video Tracking Adjustment (3)

- This section describes how to adjust the video tracking when an T slider assembly is replaced.
- Adjustment of video tracking is extremely important. If this adjustment is not adequate, the tape interchangeability is influenced significantly.
  Take utmost care in performing adjustment.
- Perform this adjustment with the cassette compartment installed in the unit. By this way, accurate adjustment will be possible without difficulty as a service operation.

Tools

Cleaning piece	: 2-034-697-00
Cleaning fluid	: 9-919-573-01
Alignment tape without lid (CR2-1B PS)	: 8-960-096-51
Tape guide adjustment driver	: J-6321-500-A
Adjustment mirror	: J-6080-029-A
Dualtrace oscilloscope	

Adjustment flow chart

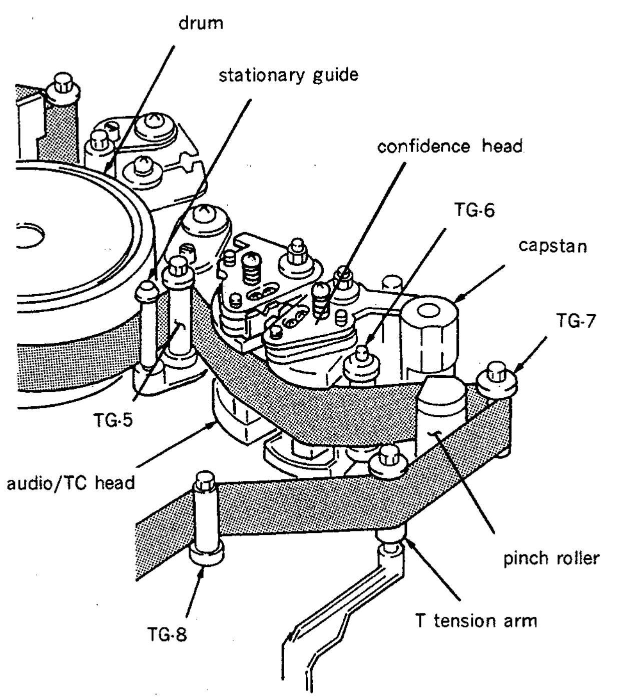
- Removal of cleaning roller assembly
- Removal of AU head cover
- Removal of residual distortion
- Adjustment of video tracking (3)
- Confirmation of tape running
- Adjustment of CTL head height
- Adjustment of audio head height
- Adjustment of audio head phase
- Adjustment of confidence head height
- Adjustment of confidence head phase
- Adjustment of CTL head position
- Adjustment of TC head position
- Confirmation of audio head height
- Confirmation of audio level (in REV mode)
- Installation of AU head cover
- Installation of cleaning roller assembly
- Adjustment of cleaning roller block position
- Adjustment of RF switching position (RP head)
- Adjustment of RF switching position (DT head)

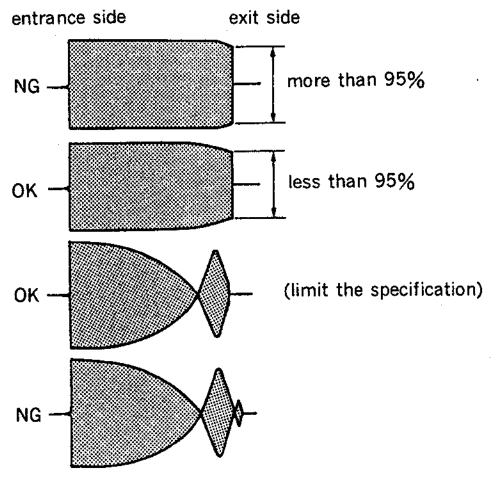
Preparation

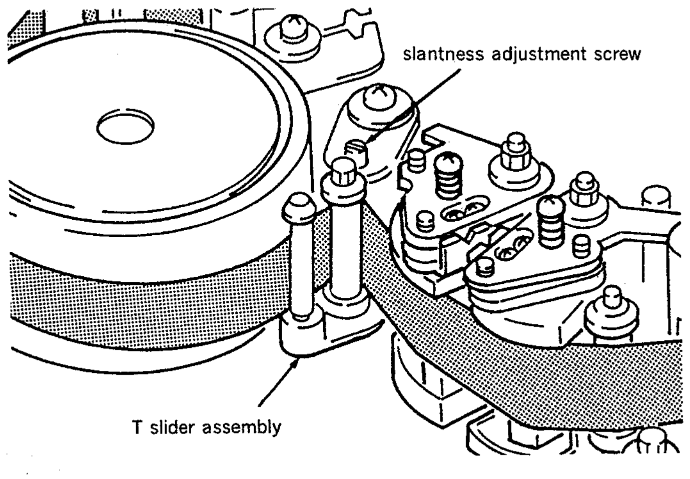
1. Remove a cleaning roller assembly.
(Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
(Refer to step (3) in Section 4-3.)
3. Set ITEM 913 of SETUP MENU to 1 (ON).
(Refer to item 7 in Section 5-1 "Tracking control procedure in DT mode.")

Adjustment

1. Clean the tape running surface of the tape guides, drum, and video heads with a cleaning piece moistened with cleaning fluid.
2. Remove residual distortion from DT head.
(Refer to item 5 in Section 5-1 "Required operation to remove residual distortion from DT head before attempting video tracking adjustment.)
3. Connect the oscilloscope as follows.
CH-1 : TP803/AFM-8 board
(Address : Side A, C-1) (Y-RF signal)
CH-2 : TP701/AFM-8 board
(Address : Side A, B-1) (Switching pulse)
TRIG : CH-2
4. Loosen the locking screws at the upper part of a TG-5 tape guide roller, TG-6 tape guide roller, TG-7 tape guide roller and T tension arm one to two turns using a tape guide adjustment driver.
5. Confirm the DT SELECT switch on the front panel is in OFF state.
6. Insert an alignment tape CR2-1B PS and put the unit into PLAY mode.
7. Turn the upper flange of the TG-5 tape guide so that a clearance occurs between the upper flange of the TG-5 tape guide and the upper edge of the tape.
8. Turn the adjustment nut of the TG-6 tape guide so that a clearance occurs between the lower flange of the TG-6 tape guide and the lower edge of the tape.
9. Turn the upper flange of the TG-7 tape guide so that a clearance occurs between the upper flange of the TG-7 tape guide and the upper edge of the tape.
10. Fine adjust the height of the tape guide of the T tension arm so that the tape runs in the center of the tape guide of the T tension arm.
11. Make sure that the tape does not run in contact with the tape guide flanges of the TG-5, TG-6, TG-7, and T tension arm.


drum
stationary guide
confidence head
TG-6
capstan
TG-7
TG-5
audio/TC head
pinch roller
TG-8
T tension arm


entrance side
exit side
NG
more than 95%
OK
less than 95%
OK
(limit the specification)
NG

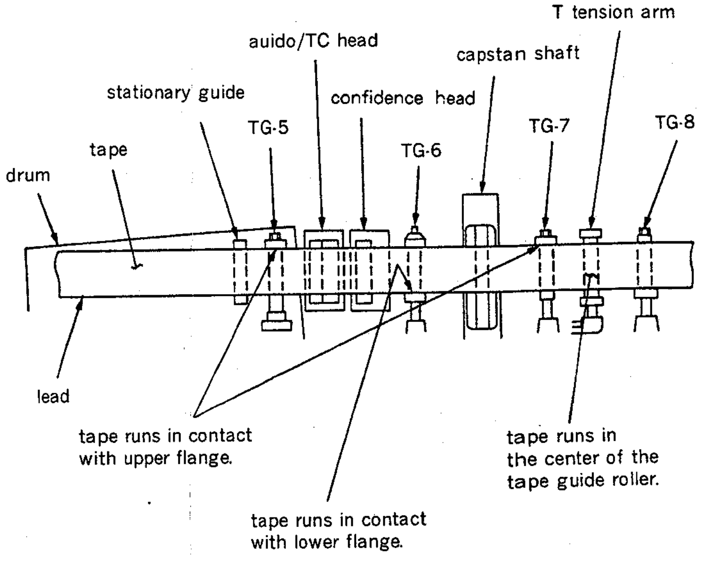

slantness adjustment screw
T slider assembly

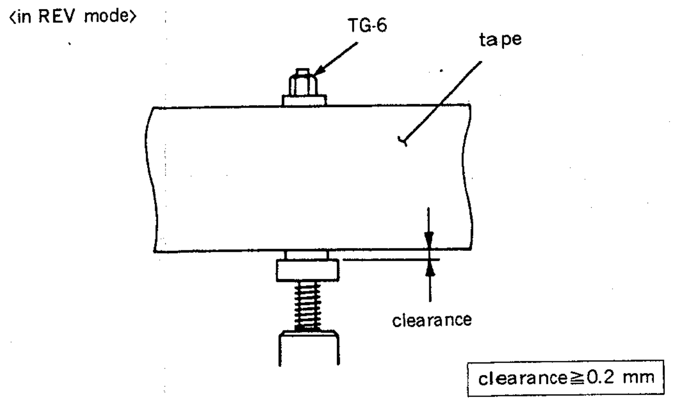
12. Turn the tracking control so that the RF envelope waveform on the drum entrance side is maximum.
13. Make sure that the RF envelope waveform satisfies the specification as shown in the figure.
If the specification is not satisfied, perform the adjustment as follows :
    1) Turn the slantness adjustment screw for a T slider assembly in counterclockwise in the range not exceeding 90 degrees to satisfy the specification.
14. Turn the upper flange of the TG-5 tape guide so that it comes in contact with the upper edge of the tape and so that the RF envelope waveform is flat.
15. Turn the tracking control so that the RF envelope waveform is 70% to 80% of the maximum output.
16. Turn the adjustment nut of the TG-6 tape guide so that the lower flange of the TG-6 tape guide comes in contact with the lower edge of the tape.
17. Put the unit into REV × 1 mode.
At that time, make sure that the clearance between the lower flange of the TG-6 tape guide and tape satisfies the specification.

Specification : The clearance between the lower flange and lower edge of the tape should be more than 0.2 mm.
If not to meet the specification, fine adjust the tape guide in PLAY and REV modes repeatedly.

18. Put the unit into PLAY mode, turn the upper flange of the TG-7 tape guide so that the upper flange of the TG-7 tape guide lightly comes in contact with the upper edge of the tape.
19. Fine adjust the height of the tape guide of the T tension arm so that the tape runs in the center of the tape guide of the T tension arm.

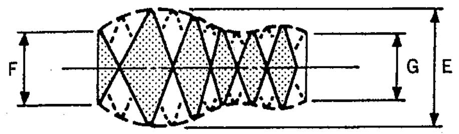
- The upper edge of the tape runs in contact with the upper flange of the TG-5 tape guide.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The lower edge of the tape runs in contact with the lower flange of the TG-6 tape guide.
However, in PLAY, F.FWD, and REW modes, the lower flange of the tape guide must not rotate.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The upper edge of the tape runs in contact with the upper flange of the TG-7 tape guide.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)
- The tape runs in the center of the guide roller of the T tension arm.
(In modes other than PLAY, if a tape curl exists at the upper or lower flange, it is acceptable to the extent of 1/10 of the tape width.)


T tension arm
auido/TC head
capstan shaft
stationary guide
confidence head
TG-5
TG-6
TG-7
TG-8
tape
drum
lead
tape runs in contact with upper flange.
tape runs in the center of the tape guide roller.
tape runs in contact with lower flange.


‹in REV mode›
TG-6
tape
clearance
clearance≧0.2 mm

20. Turn the tracking control so that the RF envelope waveform is the maximum output.
    Make sure that the head-to-tape contact of the RF envelope waveform on the drum exit side and fluctuation satisfy the specification.
    Make sure that no tape curl to occur at the tape guide flanges of the TG-5, TG-6 and TG-7 using an adjustment mirror.
    (If tape curl can not be removed, it is acceptable as far as the maximum limit shown in the figure.)
21. Select the DT SELECT switch to VAR state.
22. Turn scarch dial so that the RF envelope waveform is the maximum output.
    Make sure that the head-to-tape contact of the RF envelope waveform and fluctuation satisfy the specification.
23. Reset the DT SELECT switch to OFF state.
24. Reset ITEM 913 of SETUP MENU to 0 (OFF).
25. Put the unit into REV × 1 mode, make sure that the head-to-tape contact of the RF envelope waveform in REV × 1 mode satisfies the specification.
26. Select the DT SELECT switch to VAR state.
27. Put the unit into DT REV×1 mode, make sure that the head-to-tape contact of the RF envelope waveform in REV× 1 mode satisfies the specification.
28. Reset the DT SELECT switch to OFF state.
29. Tighten the locking screws of each tape guide using a tape guide adjustment driver.
30. Perform steps (6) through (16) in Section 5-5, and make sure that the head-to-tape contact of the RF envelope waveform and fluctuation satisfy the specification.
31. Make sure that the tape running at each tape guide satisfy the specification.
    (Refer to steps (1) through (13) in Section 5-4.)
32. Perform CTL head height adjustment.
    (Refer to Section 5-6.)
33. Perform audio head height adjustment.
    (Refer to Section 5-8.)
34. Perform audio head phase adjustment.
    (Refer to Section 5-9.)
35. Perform confidence head height adjustment.
    (Refer to section 5-11.)
36. Perform confidence head phase adjustment.
    (Refer to Section 5-12.)
37. Perform CTL head position adjustment.
    (Refer to Section 5-7.)
38. Perform TC head position adjustment.
    (Refer to Section 5-14.)

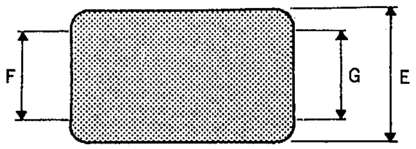
⟨in REV mode (DT OFF state)⟩



$\frac{F}{E} \geq 0.8$

$\frac{G}{E} \geq 0.8$

⟨in REV mode (DT VAR mode)⟩

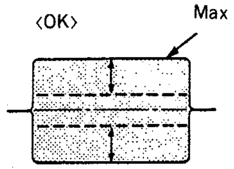


$\frac{F}{E} \geq 0.8$

$\frac{G}{E} \geq 0.8$

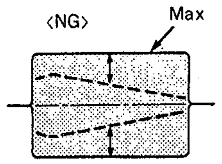
< in PLAY mode >

⟨OK⟩

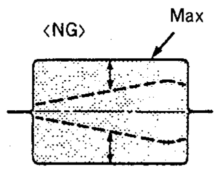


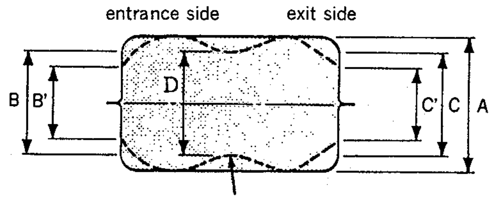
increases/decreases keeping its flat shape

⟨NG⟩



⟨NG⟩





deterioration of RF waveform because of fluctuation

A : maximum output level
D : minimum output level at center portion because of fluctuation
C, B : maximum output level at entrance and exit sides
C', B' : minimum output level at entrance and exit sides because of fluctuation

$\frac{B}{A} \geq 0.8$ $\frac{C}{A} \geq 0.8$ $\frac{D}{A} \geq 0.9$ $\frac{B'}{B} \geq 0.9$ $\frac{C'}{C} \geq 0.9$

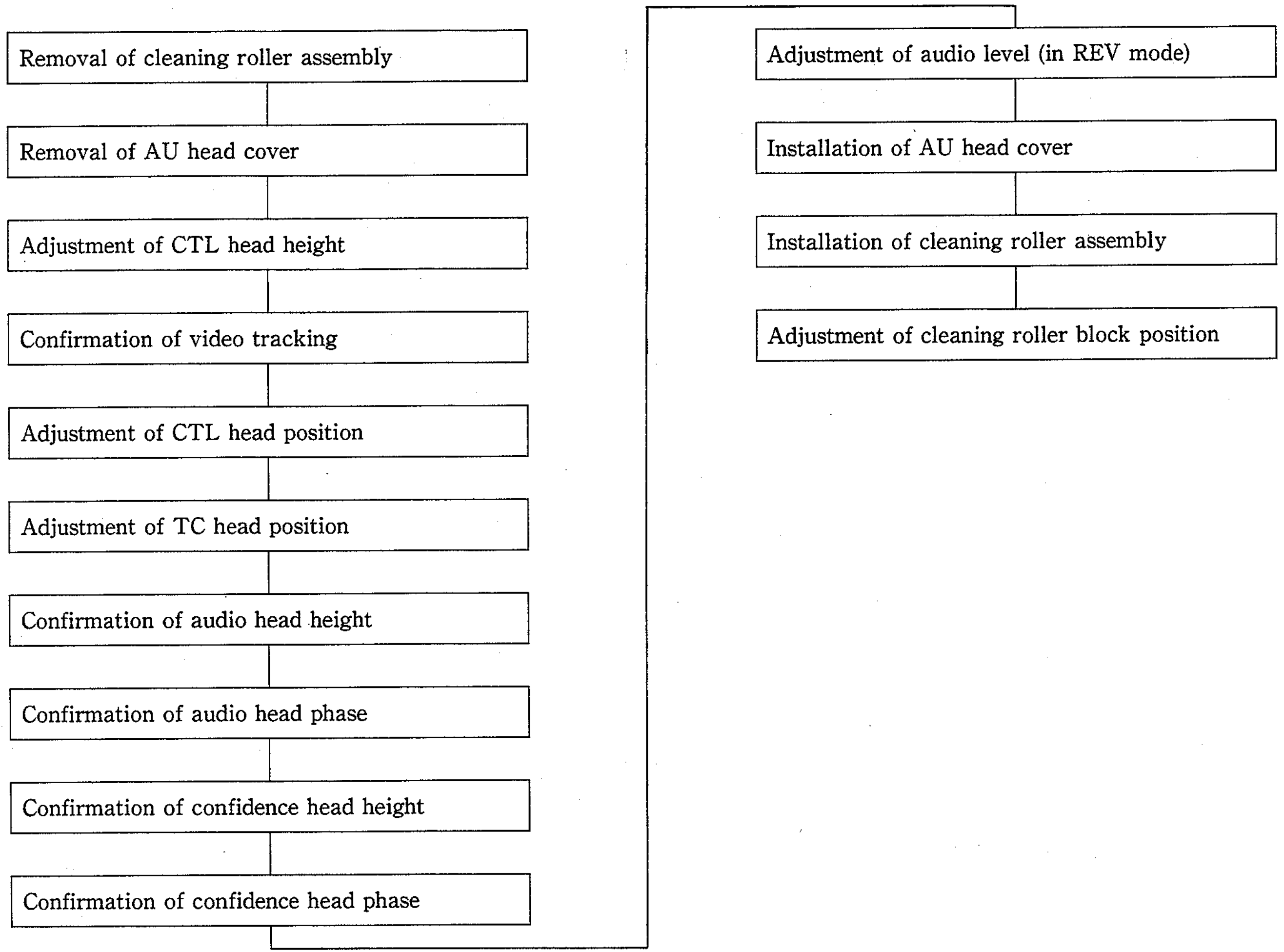
39. Perform reconfirmation of audio head height.
    (Refer to steps (1) through (3) in Section 5-8.)
40. Perform confirmation of audio level (in REV mode). (Refer to steps (1) through (4) in Section 5-15.)
41. Install the AU head cover. (Refer to step (31) in Section 4-3.)
42. Install the cleaning roller assembly.
    (Refer to steps (7) and (8) in Section 4-6.)
43. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)
44. Perform RF switching position (RP head) adjustment. (Refer to Section 5-16.)
45. Perform RF switching position (DT head) adjustment. (Refer to Section 5-17.)

5-6. CTL HEAD HEIGHT ADJUSTMENT

Tools

Alignment tape CR8-1A PS : 8-960-098-45
Dualtrace oscilloscope
Box screwdriver (Across flat has 5.5 mm)

Adjustment flow chart

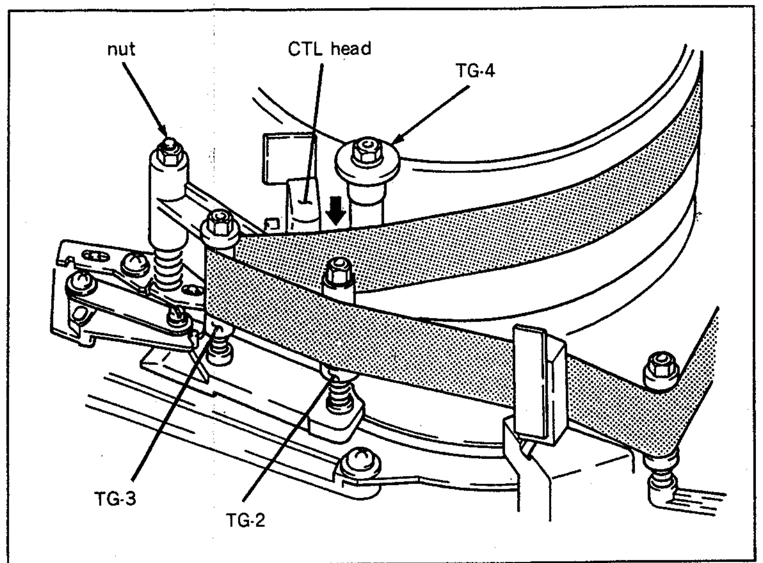

Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of CTL head height
Confirmation of video tracking
Adjustment of CTL head position
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio head phase
Confirmation of confidence head height
Confirmation of confidence head phase
Adjustment of audio level (in REV mode)
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position

Preparation

1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

Check

1. Connect the oscilloscope as follows.
   CH-1 : TP806/SS-48DP board
   (Address : Side A, D-1) (CTL signal)
2. Insert an alignment tape CR8-1A PS into the unit and play back the portion where 1 kHz signal has been recorded on a CTL track.
3. Make sure that the level goes down when the portion (between a CTL head and TG-4 tape guide) of the tape shown in the figure is pressed down or pushed up slightly.
   If the level goes up, perform steps (4) and later.
   If the level goes down, perform steps (5) and later.


nut
CTL head
TG-4
TG-3
TG-2

Adjustment

4. In case the level goes up when the tape is pressed down :
   (1) Turn the nut shown in the figure in counterclockwise using a box screwdriver so that the output waveform is maximum.
   In case the level goes up when the tape is pushed up :
   (1) Turn the nut shown in the figure in clockwise using a box screwdriver so that the output waveform is maximum.
5. Make sure that the video tracking on the drum entrance side satisfied the specification. (Refer to Section 5-5.)
6. Perform CTL head position adjustment. (Refer to Section 5-7.)
7. Perform TC head position adjustment. (Refer to Section 5-14.)
8. Perform confirmation of audio head height. (Refer to steps (1) through (3) in Section 5-8.)
9. Perform confirmation of audio head phase. (Refer to steps (1) through (4) in Section 5-9.)
10. Perform confirmation of confidence head height. (Refer to steps (1) through (4) in Section 5-11.)
11. Perform confirmation of confidence head phase. (Refer to steps (1) through (5) in Section 5-12.)
12. Perform audio level adjustment (in REV mode). (Refer to Section 5-15.)
13. Install the AU head cover. (Refer to step (31) in Section 4-3.)
14. Install the cleaning roller assembly. (Refer to steps (7) and (8) in Section 4-6.)
15. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)

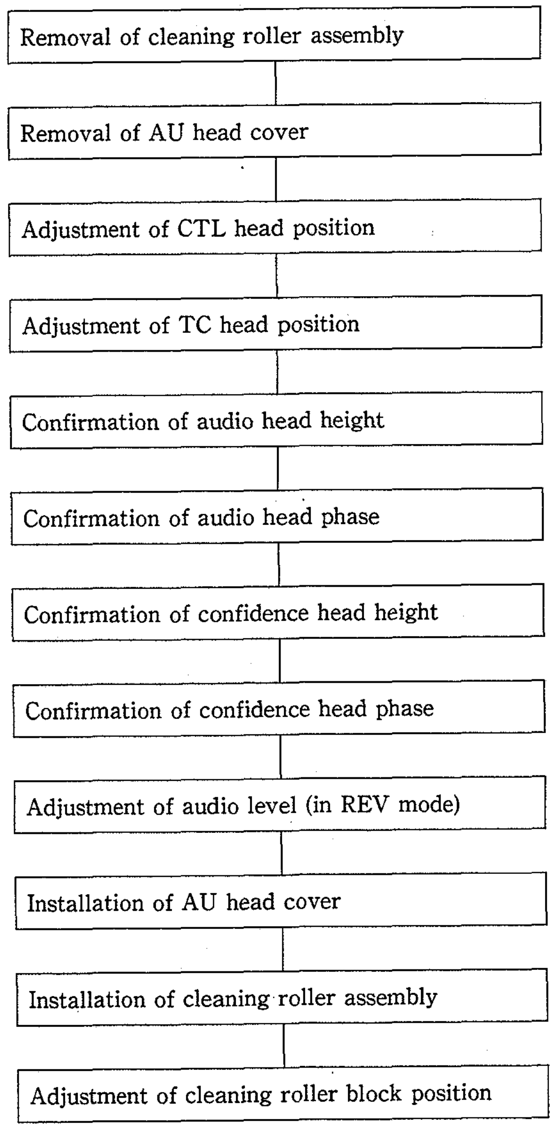
5-7. CTL HEAD POSITION ADJUSTMENT

- Adjustment of CTL head position is extremely important. If this adjustment is not adequate, the tape interchangeability is influenced significantly.
  Take utmost care in performing adjustment.
- Perform this adjustment with the cassette compartment installed in the unit.

Tools

Alignment tape CR2-1B PS : 8-960-096-51
Dualtrace oscilloscope

Adjustment flow chart


Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of CTL head position
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio head phase
Confirmation of confidence head height
Confirmation of confidence head phase
Adjustment of audio level (in REV mode)
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position

Preparation

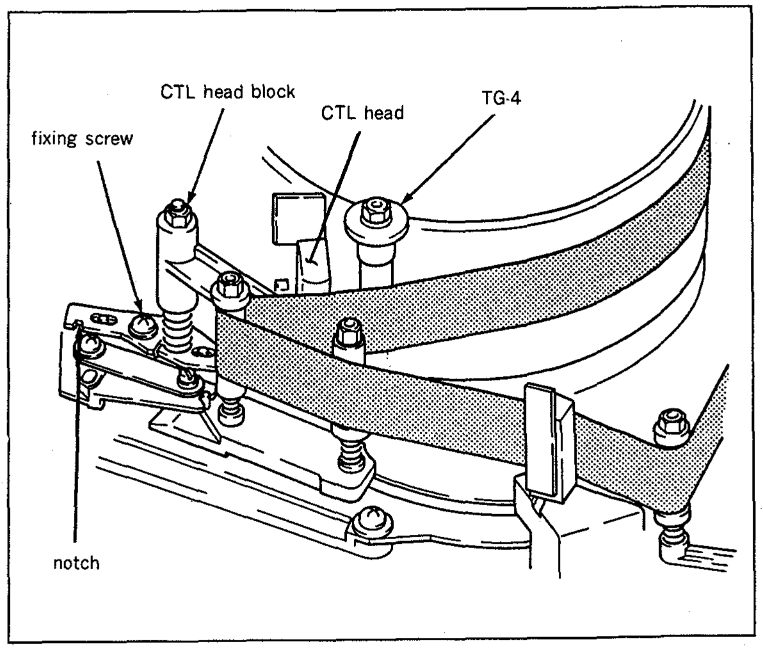
1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

Check

1. Connect the oscilloscope as follows.
   CH-1 : TP803/AFM-8 board
   (Address : Side A, C-1) (CTL signal)
   CH-2 : TP701/AFM-8 board
   (Address : Side A, B-1) (Switching pulse)
   TRIG : CH-2
2. Select the DT SELECT switch to OFF state.
3. Insert an alignment tape CR2-1B PS into the unit and put the unit into PLAY mode.
4. Turn the tracking control and confirm that the output in the center of the RF envelope waveform is maximum when it is set to the FIX position.
   If the specification is satisfied, perform steps (10) and later.
   If the specification is not satisfied, perform steps (5) and later.

Adjustment

5. Turn the tracking control and set it to the FIX position.
6. Loosen a fixing screw of the CTL head block by 1/4 to 1/2 turn.
7. Insert a 3 mm flatbladed screwdriver into the notch of the CTL head block and adjust the CTL head block position so that the center level of the RF envelope waveform is maximized.
8. Tighten a fixing screw of the CTL head block.
9. Make sure that the specification is satisfied in accordance with the check procedures.
10. Perform TC head position adjustment.
    (Refer to Section 5-14.)
11. Perform confirmation of audio head height.
    (Refer steps (1) through (3) in Section 5-8.)
12. Perform confirmation of audio head phase.
    (Refer to steps (1) through (4) in Section 5-9.)
13. Perform confirmation of confidence head height. (Refer to steps (1) through (4) in Section 5-11.)
14. Perform confirmation of confidence head phase. (Refer to steps (1) through (5) in Section 5-12.)


CTL head block
CTL head
TG-4
fixing screw
notch

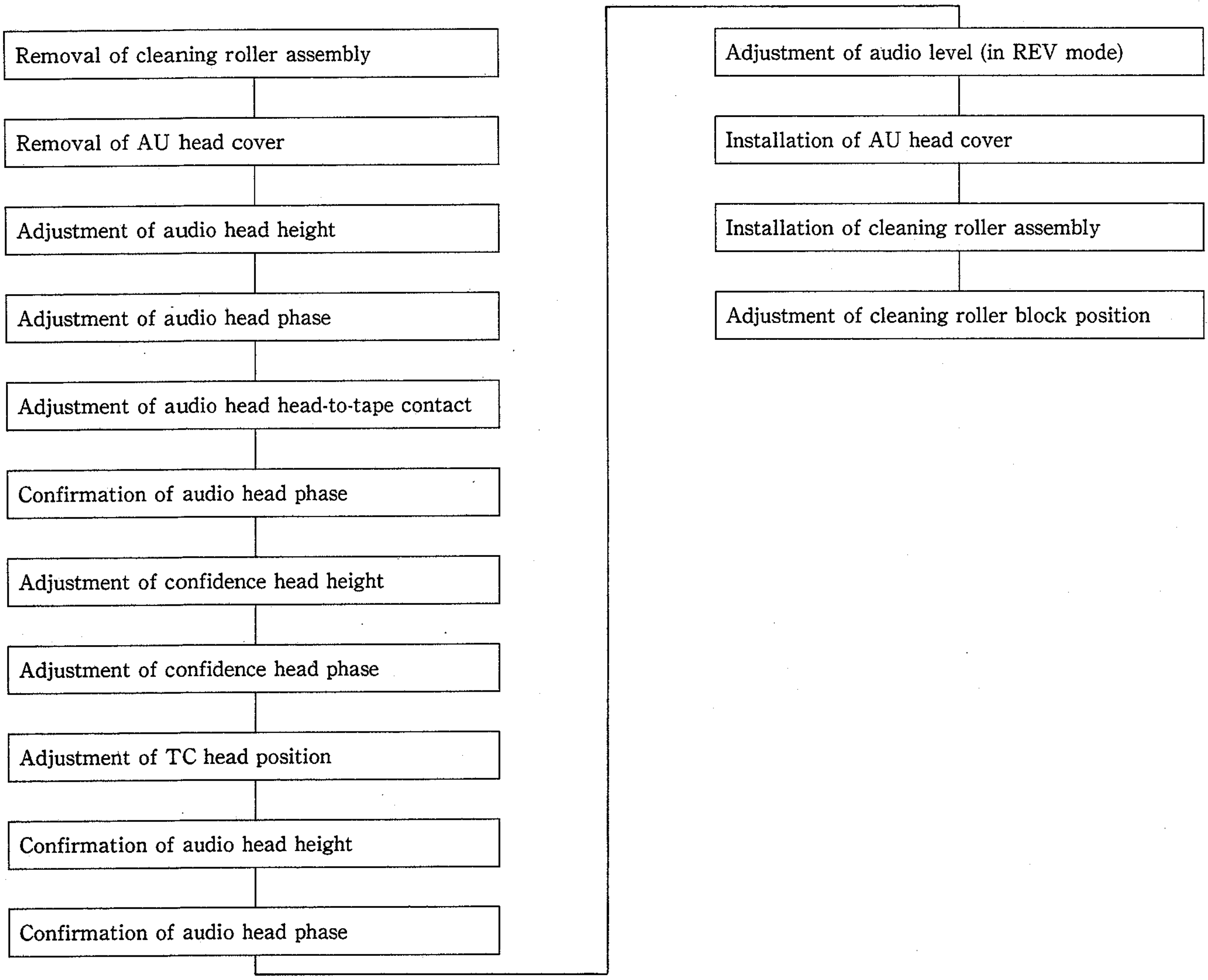
15. Perform audio level adjustment (in REV mode). (Refer to Section 5-15.)
16. Install the AU head cover. (Refer to step (31) in Section 4-3.)
17. Install the cleaning roller assembly.
    (Refer to steps (7) and (8) in Section 4-6.)
18. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)

5-8. AUDIO HEAD HEIGHT ADJUSTMENT

Tools

Alignment tape CR8-1A PS : 8-960-098-45
Dualtrace oscilloscope
Box screwdriver (Across flat has 5.5 mm)

Adjustment flow chart

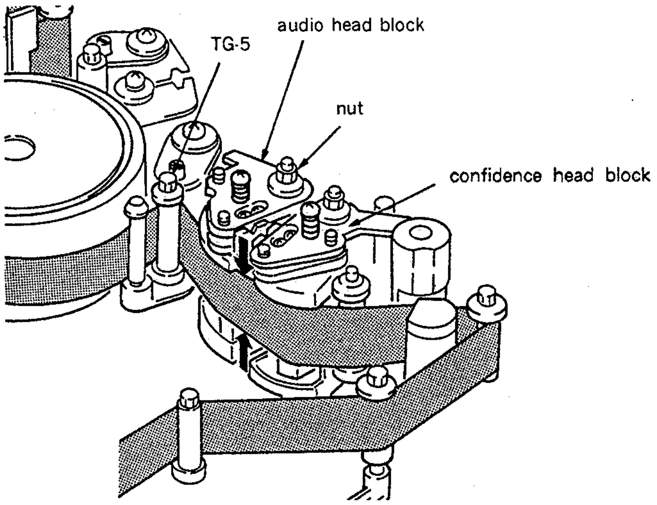

Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of audio head height
Adjustment of audio head phase
Adjustment of audio head head-to-tape contact
Confirmation of audio head phase
Adjustment of confidence head height
Adjustment of confidence head phase
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio head phase
Adjustment of audio level (in REV mode)
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position

Preparation

1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

Check

1. Connect the oscilloscope as follows.
   CH-1 : TP151/AU-146P board
   (Address : Side A, E-5) (AUDIO CH-1)
   CH-2 : TP251/AU-146P board
   (Address : Side A, C-5) (AUDIO CH-2)
2. Insert an alignment tape CR8-1A PS into the unit and play back the 1 kHz 0 VU (8:00 to 10:00) audio signal portion.
3. Make sure that the level goes down when the portion (between an audio head and TG-6 tape guide) of the tape shown in the figure is pressed down or pushed up.
   If the level goes up, perform steps (4) and later.
   If the level goes down, perform steps (5) and later.



Adjustment

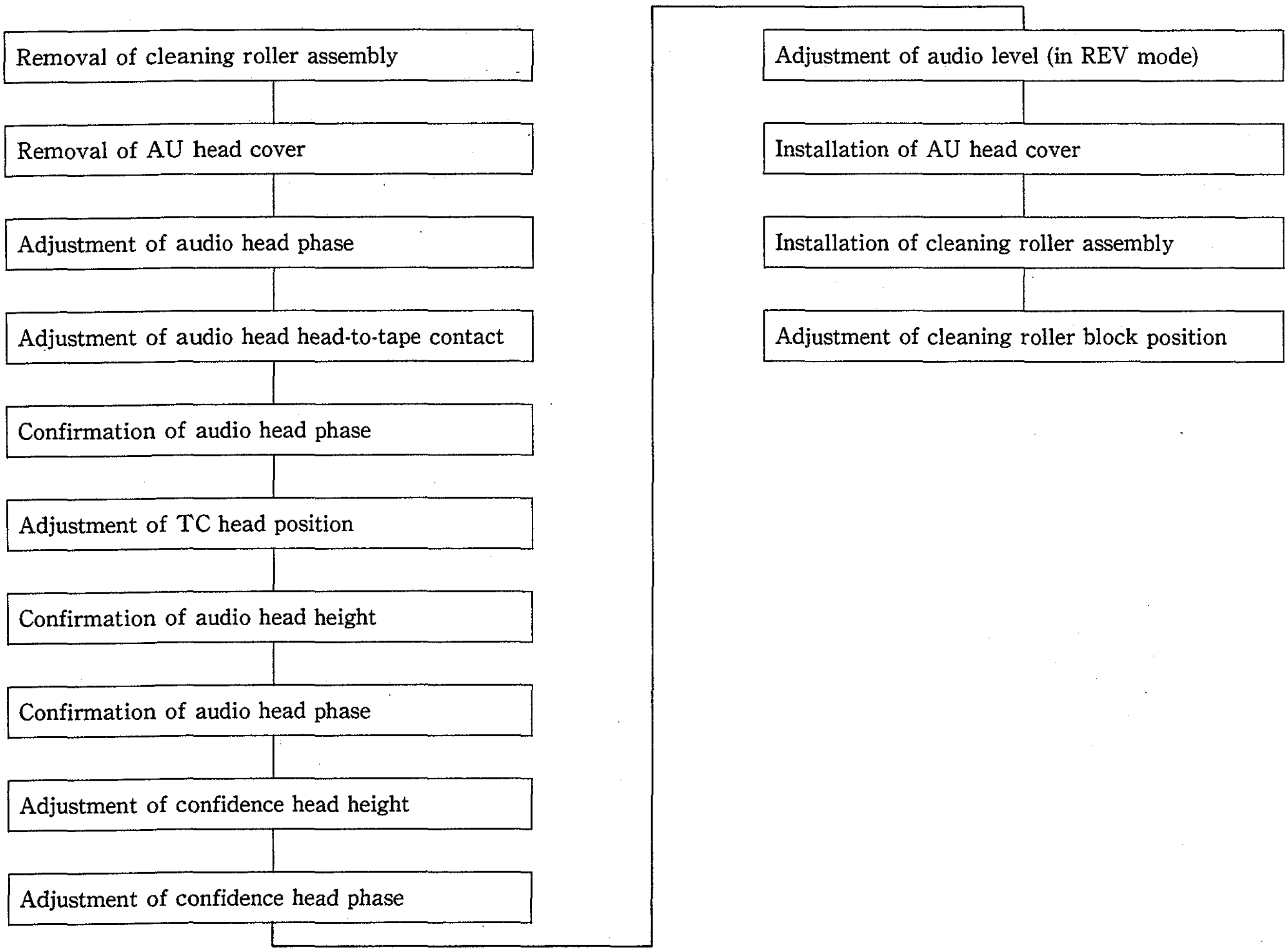
4. In case the level goes up when the tape is pressed down :
   (1) Turn the nut shown in the figure in counterclockwise using a box screwdriver so that the output waveform is maximum.
   In case the level goes up when the tape is pushed up :
   (1) Turn the nut shown in the figure in clockwise using a box screwdriver so that the output waveform is maximum.
5. Perform audio head phase adjustment. (Refer to Section 5-9.)
6. Perform audio head head-to-tape contact adjustment. (Refer to Section 5-10.)
7. Perform confirmation of audio head phase. (Refer to steps (1) through (4) in Section 5-9.)
8. Perform confidence head height adjustment. (Refer to Section 5-11.)
9. Perform confidence head phase adjustment. (Refer to Section 5-12.)
10. Perform TC head position adjustment. (Refer to Section 5-14.)
11. Perform confirmation of audio head height. (Refer to steps (2) and (3) in Section 5-8.)
12. Perform confirmation of audio head phase. (Refer to steps (1) through (4) in Section 5-9.)
13. Perform audio level adjustment (in REV mode). (Refer to Section 5-15.)
14. Install the AU head cover. (Refer to step (31) in Section 4-3.)
15. Install the cleaning roller assembly. (Refer to steps (7) and (8) in Section 4-6.)
16. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)

5-9. AUDIO HEAD PHASE ADJUSTMENT

Tools

Alignment tape CR8-1A PS : 8-960-098-45
Dualtrace oscilloscope

Adjustment flow chart


Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of audio head phase
Adjustment of audio head head-to-tape contact
Confirmation of audio head phase
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio head phase
Adjustment of confidence head height
Adjustment of confidence head phase
Adjustment of audio level (in REV mode)
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position

Preparation

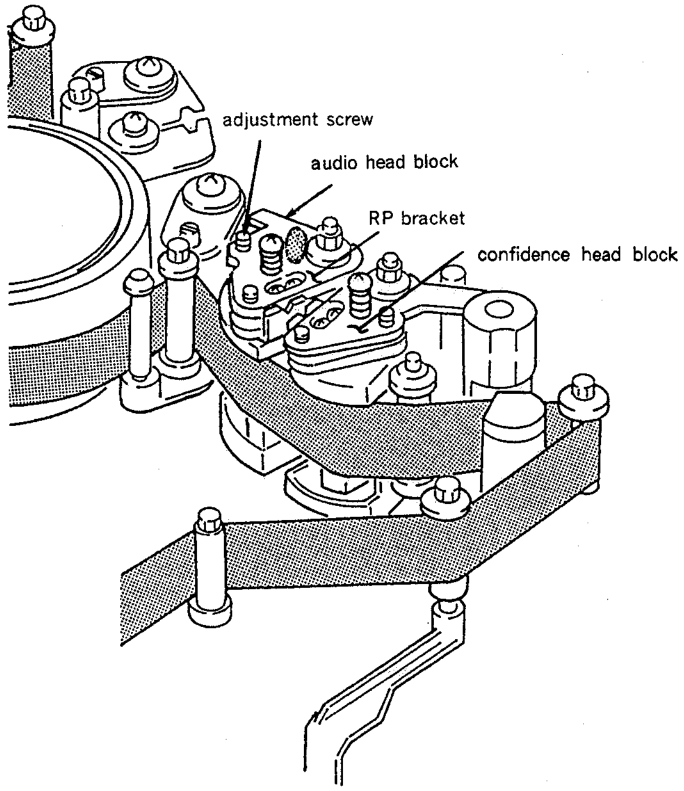
1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

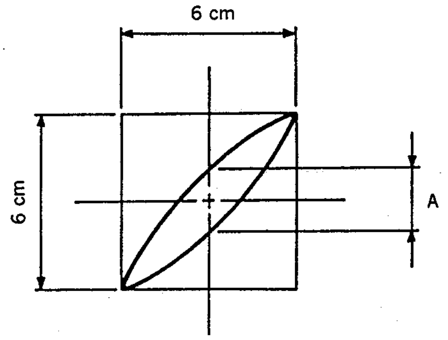
Check

1. Connect the oscilloscope as follows.
   CH-1 : TP151/AU-146P board
   (Address : Side A, E-5) (AUDIO CH-1)
   CH-2 : TP251/AU-146P board
   (Address : Side A, C-5) (AUDIO CH-2)
2. Insert an alignment tape CR8-1A PS into the unit and play back the 10 kHz, -10 dB (3 : 00 to 4 : 55) audio signal portion.
3. Adjust the scope for horizontal and vertical amplitude to 6 cm of a lissajous waveform.
4. Make sure that the vertical amplitude at the center of the horizontal direction satisfies the specification.
   Then, strike the portion of a RP bracket shown in the figure lightly with the tip of a screwdriver and make sure that the phase in this case satisfies the specification.
   If the specification is satisfied, perform steps (7) and later.
   If the specification is not satisfied, perform steps (5) and later.

Adjustment

5. Turn the adjustment screw shown in the figure so that the specification is satisfied.
6. Perform step (4) in the check procedure, then perform reconfirmation of audio head phase.
7. Perform audio head head-to-tape contact adjustment. (Refer to Section 5-10.)
8. Perform step (4) in the check procedure, then perform reconfirmation of audio head phase.
9. Perform TC head position adjustment.
   (Refer to Section 5-14.)
10. Perform confirmation of audio head height.
    (Refer to steps (1) through (3) in Section 5-8.)
11. Perform step (4) in the check procedure, then perform reconfirmation of audio head phase.
12. Perform confidence head height adjustment.
    (Refer to Section 5-11.)
13. Perform confidence head phase adjustment.
    (Refer to Section 5-12.)
14. Perform audio level adjustment (in REV mode). (Refer to Section 5-15.)
15. Install the AU head cover.
    (Refer to step (31) in Section 4-3.)
16. Install the cleaning roller assembly.
    (Refer to steps (7) and (8) in Section 4-6.)
17. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)





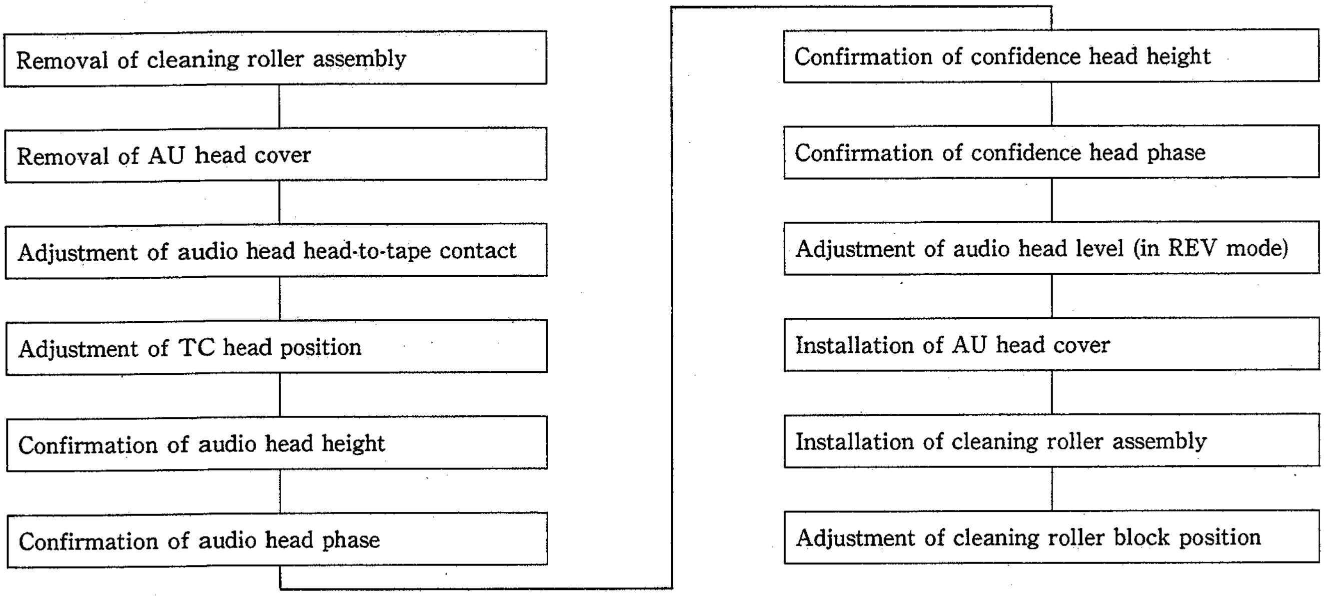
Spec. : A ≦ 0.52 cm

5-10. AUDIO HEAD HEAD-TO-TAPE CONTACT ADJUSTMENT

Tools

Alignment tape CR8-1A PS	: 8-960-098-45
Audio level meter	
Tension scale	: 7-732-050-20

Adjustment flow chart


Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of audio head head-to-tape contact
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio head phase
Confirmation of confidence head height
Confirmation of confidence head phase
Adjustment of audio head level (in REV mode)
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position

Preparation

1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

Check

1. Connect an audio level meter as follows.
   CH-1 : AUDIO OUT CH-1 connector on the connector panel
   CH-2 : AUDIO OUT CH-2 connector on the connector panel
2. Insert an alignment tape CR8-1A PS into the unit and play back the 10 kHz, -10 dB (3 : 00 to 4 : 55) audio signal portion.
3. Push the upper part of the tape between an audio head and confidence head slightly in the direction shown by the arrow. Push the upper part of the tape between the audio head and confidence head slightly in the direction shown by the arrow.
   Make sure that the change in a level satisfies specification 1 in both channels.

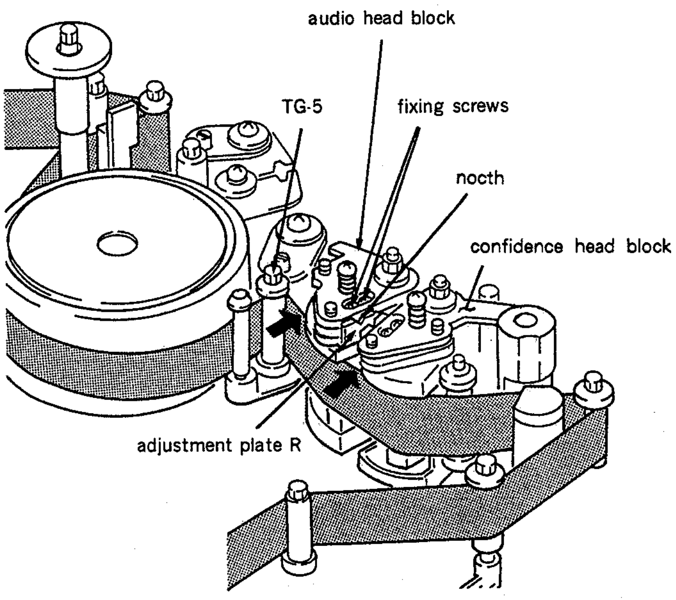
4. Put the tension scale on the portion of a S tension arm shown in the figure, and push it in the direction shown by the arrow until 20 g is indicated.
   Make sure that the change in a level satisfies specification 2 in both channels.

   Specification 2 : The change in a level must be less than 0.3 dB.

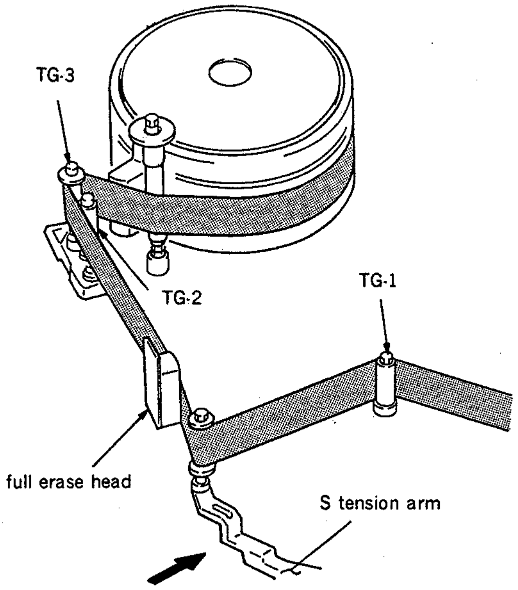
   If specifications 1 and 2 are satisfied, perform steps (9) and later.
   If specification 1 or 2 is satisfied, perform steps (5) and later.

Adjustment

5. Loosen two fixing screws of the head shown in the figure by 1/4 to 1/2 turn.
6. Insert a 3 mm flatbladed screwdriver into the notch of an adjustment plate R shown in the figure and adjust the head-to-tape contact so that the level is maximum.
7. Tighten two screws of the head.
8. Make sure that the specification is satisfied in accordance with the check procedure.
9. Perform TC head position adjustment. (Refer to Section 5-14.)
10. Perform confirmation of audio head height. (Refer to steps (1) through (3) in Section 5-8.)
11. Perform confirmation of audio head phase. (Refer to steps (1) through (4) in Section 5-9.)
12. Perform confirmation of confidence head height. (Refer to steps (1) through (4) in Section 5-11.)
13. Perform confirmation of confidence head phase. (Refer to steps (1) through (5) in Section 5-12.)
14. Perform audio level adjustment (in REV mode). (Refer to Section 5-15.)
15. Install the AU head cover. (Refer to step (31) in Section 4-3.)
16. Install the cleaning roller assembly. (Refer to steps (7) and (8) in Section 4-6.)
17. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)



Specl. : The chauge in a level must be less than 0.3 dB.



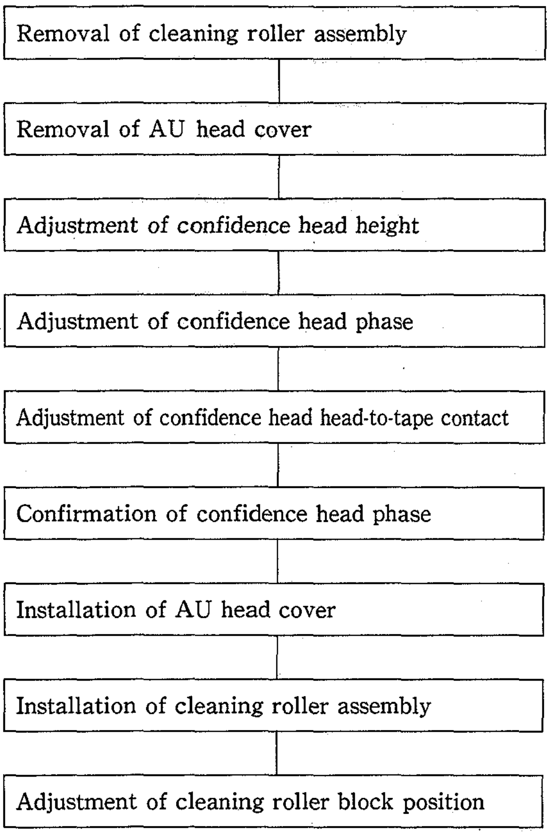
Spec2 : The change in a level must be less than 0.3 dB

5-11. CONFIDENCE HEAD HEIGHT ADJUSTMENT

Tools

Alignment tape CR8-1A PS : 8-960-098-45
Dualtrace oscilloscope
Box screwdriver (Across flat has 5.5 mm)

Adjustment flow chart

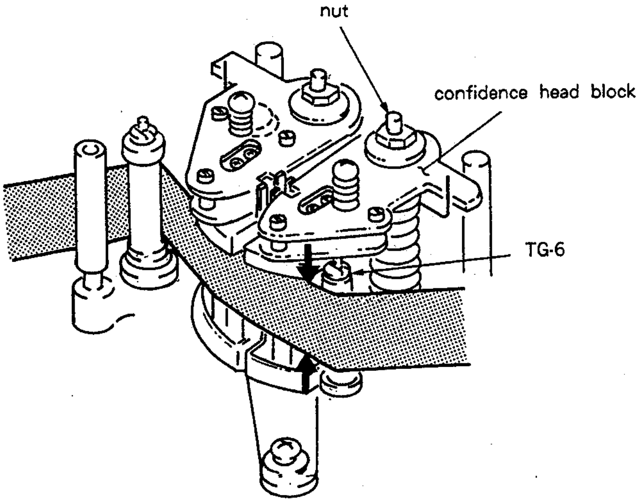

Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of confidence head height
Adjustment of confidence head phase
Adjustment of confidence head head-to-tape contact
Confirmation of confidence head phase
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position

Preparation

1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

Check

1. Connect the oscilloscope as follows.
   CH-1 : TP151/AU-146P board
   (Address : Side A, E-5) (CONFI CH-1)
   CH-2 : TP251/AU-146P board
   (Address : Side A, C-5) (CONFI CH-2)
2. Put S901 on AU-146P board to ON.
3. Insert an alignment tape CR8-1A PS into the unit and play back the 1 kHz 0 VU (8:00 to 10:00) audio signal portion.
4. Make sure that the level goes down when the portion (between a confidence head and TG-6 tape guide) of the tape shown in the figure is pressed down or pushed up.
   If the level goes up, perform steps (5) and later.
   If the level goes down, perform steps (6) and later.



Adjustment

5. In case the level goes up when the tape is pressed down :
   (1) Turn the nut shown in the figure in counterclockwise using a box screwdriver so that the output waveform is maximum.

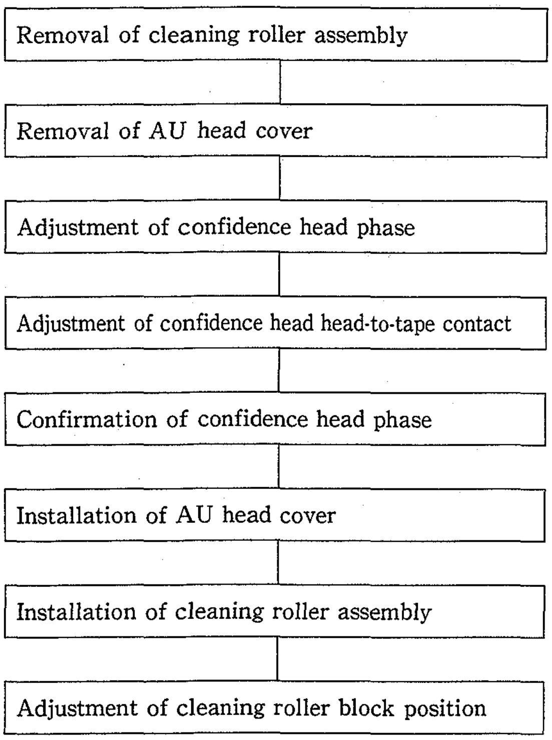
   In case the level goes up when the tape is pushed up :
   (1) Turn the nut shown in the figure in clockwise using a box screwdriver so that the output waveform is maximum.
6. Perform confidence head phase adjustment. (Refer to Section 5-12.)
7. Perform confidence head head-to-tape contact adjustment. (Refer to Section 5-13.)
8. Perform confirmation of confidence head phase.
   (Refer to steps (1) through (5) in Section 5-12.)
9. After adjustment, put S901 on AU-146P board to OFF.
10. Install the AU head cover. (Refer to step (31) in Section 4-3.)
11. Install the cleaning roller block. (Refer to steps (7) and (8) in Section 4-6.)
12. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)

5-12. CONFIDENCE HEAD PHASE ADJUSTMENT

Tools

Alignment tape CR8-1A PS : 8-960-098-45
Dualtrace oscilloscope

Adjustment flow chart


Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of confidence head phase
Adjustment of confidence head head-to-tape contact
Confirmation of confidence head phase
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position

Preparation

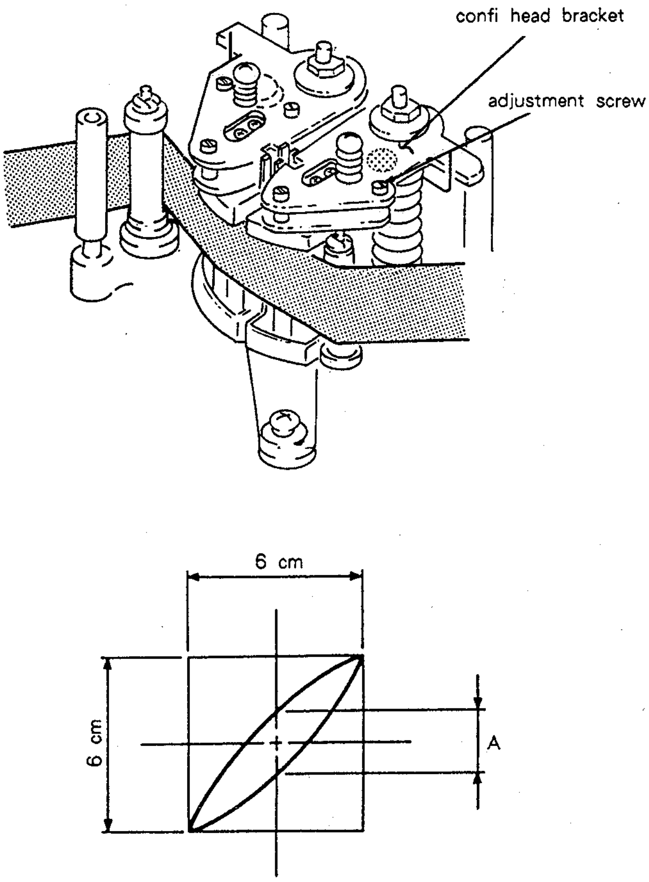
1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

Check

1. Connect the oscilloscope as follows.
   CH-1 : TP151/AU-146P board
   (Address : Side A, E-5) (CONFI CH-1)
   CH-2 : TP251/AU-146P board
   (Address : Side A, C-5) (CONFI CH-2)
2. Put S901 on AU-146P board to ON.
3. Insert an alignment tape CR8-1A PS into the unit and play back the 10 kHz, -10 dB (3 : 00 to 4 : 55) audio signal portion.
4. Adjust the scope for horizontal and vertical amplitude to 6 cm of a lissajous waveform.
5. Make sure that the vertical amplitude at the center of the horizontal direction satisfies the specification.
   Then, strike the shaded portion of a confi-head bracket shown in the figure lightly with the tip of a screwdriver and make sure that the phase in this case satisfies the specification.
   If the specification is satisfied, perform steps (8) and later.
   If the specification is not satisfied, perform steps (6) and later.

Adjustment

6. Turn the adjustment screw shown in the figure so that the specification is satisfied.
7. Perform step (5) in the check procedure, then perform reconfirmation of confidence head phase.
8. Perform confirmation of confidence head head-to-tape contact. (Refer to Section 5-13.)
9. Perform step (5) in the check procedure, then perform reconfirmation of confidence head phase.
10. After adjustment, put S901 on AU-146P board to OFF.
11. Install the AU head cover. (Refer to step (31) in Section 4-3.)
12. Install the cleaning roller block. (Refer to steps (7) and (8) in Section 4-6.)
13. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)



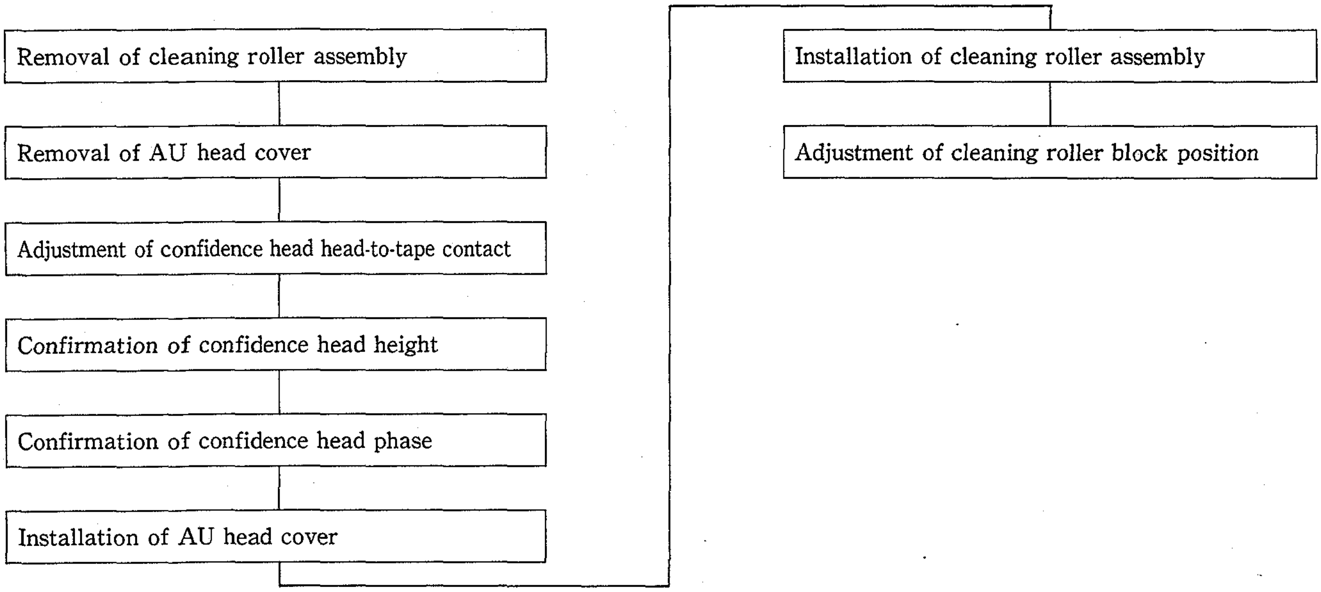
Spec. : A ≦ 0.52 cm

5-13. CONFIDENCE HEAD HEAD-TO-TAPE CONTACT ADJUSTMENT

Tools

Alignment tape CR8-1A PS	: 8-960-098-45
Audio level meter	
Tension scale	: 7-732-050-20

Adjustment flow chart



Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of confidence head head-to-tape contact
Confirmation of confidence head height
Confirmation of confidence head phase
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position

Preparation

1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

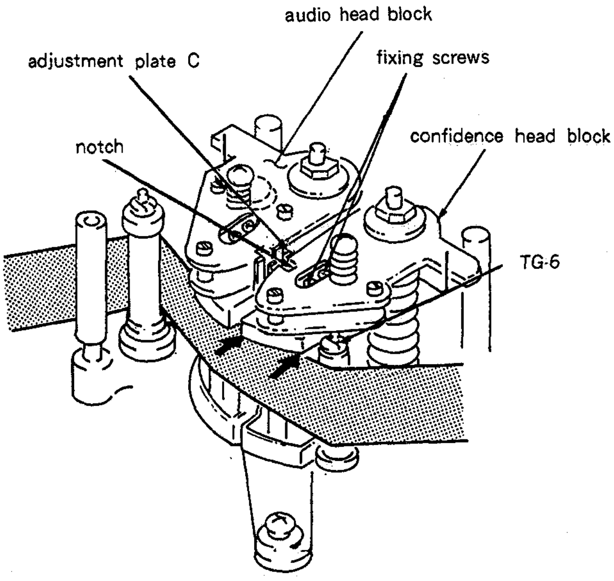
Check

1. Connect an audio level meter as follows.
   CH-1 : AUDIO OUT CH-1 connector on the connector panel
   CH-2 : AUDIO OUT CH-2 connector on the connector panel
2. Put S901 on AU-146P board to ON.
3. Insert an alignment tape CR8-1A PS into the unit and play back the 10 kHz, -10 dB (3 : 00 to 4 : 55) audio signal portion.

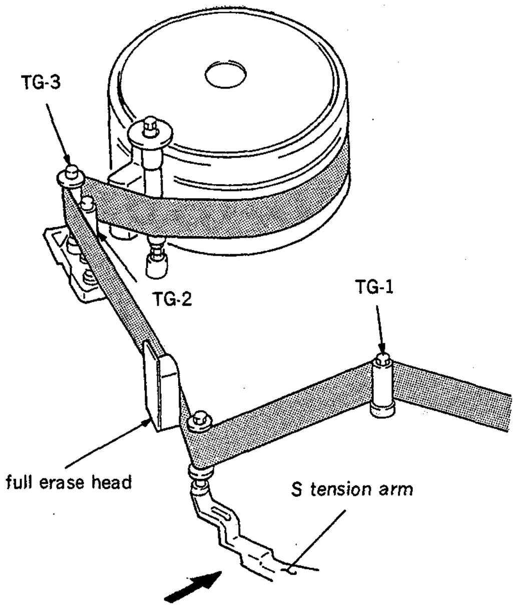
4. Push the upper part of the tape between an audio head and confidence head slightly in the direction shown by the arrow. Push the upper part of the tape between the confidence head and TG-6 tape guide slightly in the direction shown by the arrow.
   Make sure that the change in a level satisfies specification 1 in both channels.
   Specification 1 : The change in a level must be less than 0.3 dB.
5. Put the tension scale on the portion of a S tension arm shown in the figure, and push it in the direction shown by the arrow until 20 g is indicated.
   Make sure that the change in a level satisfies specification 2 in both channels.
   Specification 2 : The change in a level must be less than 0.3 dB.
   If specifications 1 and 2 are satisfied, perform steps (10) and later.
   If specification 1 or 2 is satisfied, perform steps (6) and later.

Adjustment

6. Loosen two fixing screws of the head shown in the figure by 1/4 to 1/2 turn.
7. Insert a 3 mm flatblade screwdriver into the notch of an adjustment plate C shown in the figure and adjust the head-to-tape contact so that the level is maximum.
8. Tighten two screws of the head.
9. Make sure that the specification is satisfied in accordance with the check procedure.
10. Perform confirmation of confidence head height.
    (Refer to steps (1) through (4) in Section 5-11.)
11. Perform confirmation of confidence head phase.
    (Refer to steps (1) through (5) in Section 5-12.)
12. After adjustment, put S901 on AU-146P board to OFF.
13. Install the AU head cover. (Refer to step (31) in Section 4-3.)
14. Install the cleaning roller block. (Refer to steps (7) and (8) in Section 4-6.)
15. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)



Spec1. : The chauge in a level must be less than 0.3 dB.



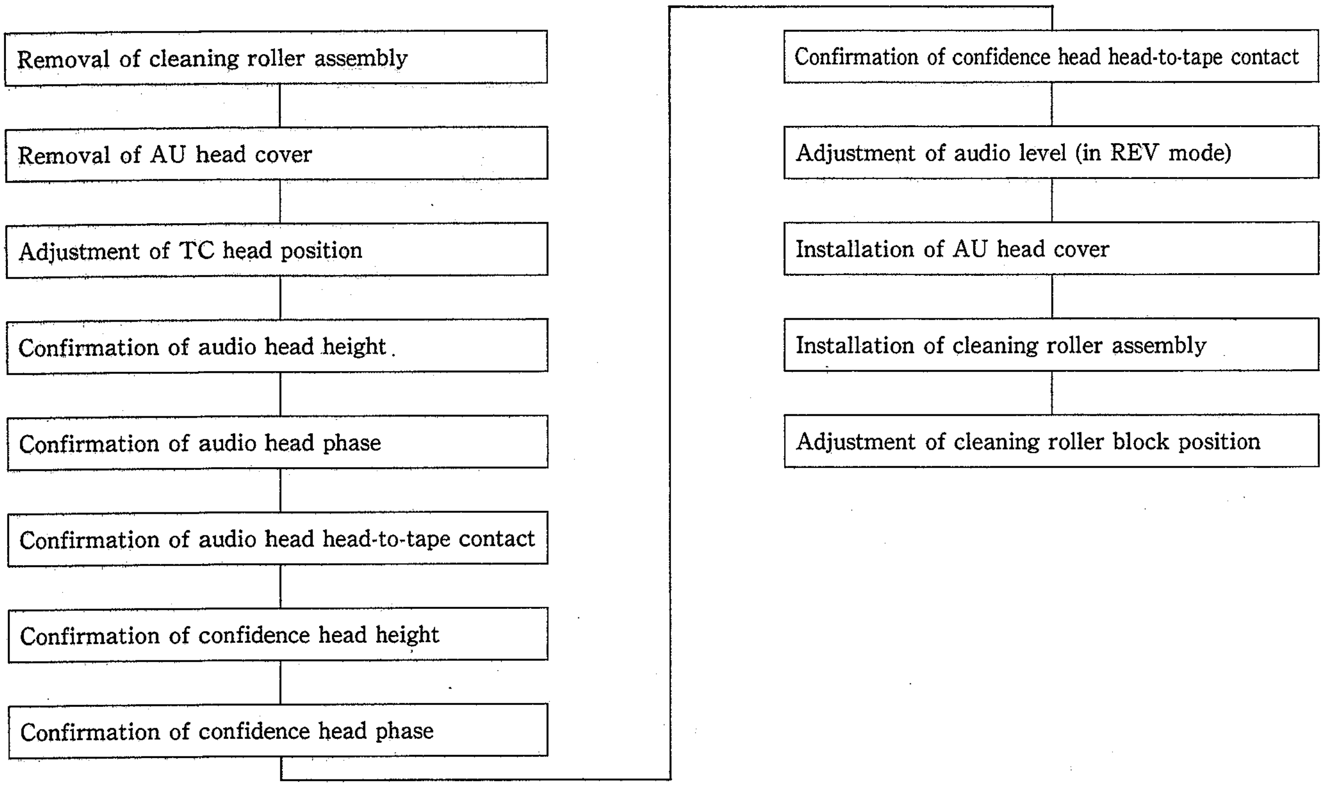
Spec2 : The change in a level must be less than 0.3 dB

5-14. TC HEAD POSITION ADJUSTMENT

Tools

Alignment tape CR2-1B : 8-960-096-01
Dualtrace oscilloscope

Adjustment flow chart


Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of TC head position
Confirmation of audio head height
Confirmation of audio head phase
Confirmation of audio head head-to-tape contact
Confirmation of confidence head height
Confirmation of confidence head phase
Confirmation of confidence head head-to-tape contact
Adjustment of audio level (in REV mode)
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position

Preparation

1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

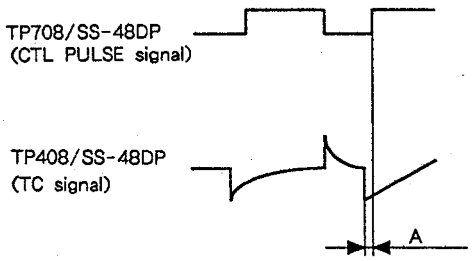
Check

1. Connect the oscilloscope as follows.
   CH-1 : TP708/SS-48DP board
   (Address : Side A, C-1) (CTL PULSE signal)
   CH-2 : TP408/SS-48DP board
   (Address : Side A, J-1) (TC signal)
   TRIG : TP701/AFM-8 board
   (Address : Side A, B-1)
   (Switching pulse)
2. Insert an alignment tape CR2-1B PS into the unit and put the unit into PLAY mode.

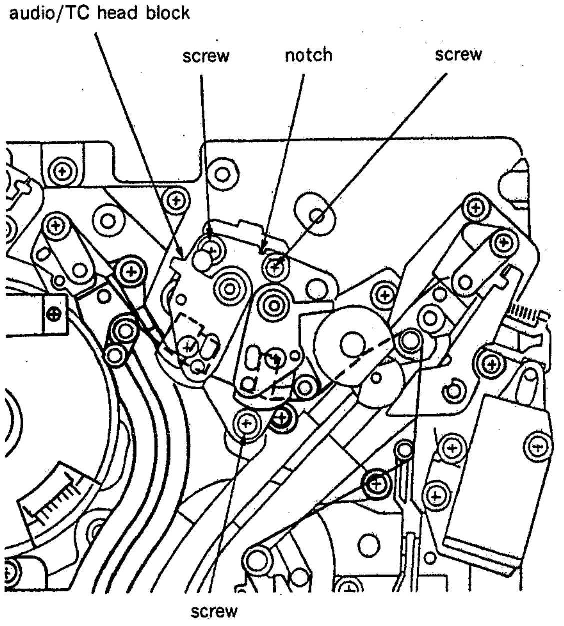
3. Make sure that the positional relationship between a CTL signal and TC signal satisfy the specification.
   If the specification is satisfied, perform steps (8) and later.
   If the specification is not satisfied, perform steps (4) and later.

Adjustment

4. Loosen three fixing screws of an audio/TC head block by 1/4 to 1/2 turn.
5. Insert a 3 mm flatbladed screwdriver into the notch of the audio/TC head block shown in the figure and adjust the audio/TC head block position so that the specification is satisfied.
6. Tighten three screws of the audio/TC head block.
7. Make sure that the specification is satisfied in accordance with the check procedure.
8. Perform confirmation of audio head height. (Refer to steps (1) through (3) in Section 5-8.)
9. Perform confirmation of audio head phase. (Refer to steps (1) through (4) in Section 5-9.)
10. Perform confirmation of audio head head-to-tape contact. (Refer to steps (1) through (4) in Section 5-10.)
11. Perform confirmation of confidence head height. (Refer to steps (1) through (4) in Section 5-11.)
12. Perform confirmation of confidence head phase. (Refer to steps (1) through (5) in Section 5-12.)
13. Perform confirmation of confidence head head-to-tape contact. (Refer to steps (1) through (5) in Section 5-13.)
14. Perform audio level adjustment (in REV mode). (Refer to Section 5-15.)
15. Install the AU head cover. (Refer to step (31) in Section 4-3.)
16. Install the cleaning roller assembly.
    (Refer to steps (7) and (8) in Section 4-6.)
17. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)



Spec. : A=0 ± 400 μs

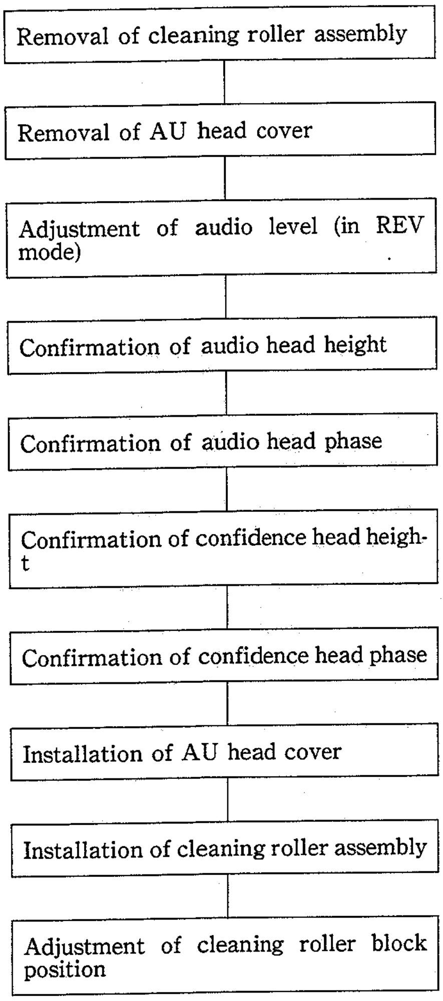


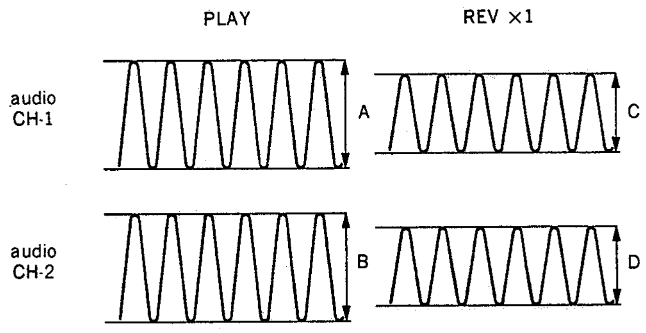
5-15. AUDIO LEVEL ADJUSTMENT (IN REV MODE)

Tools

Alignment tape CR8-1A PS	: 8-960-098-45
Tape guide adjustment driver	: J-6321-500-A
Adjustment mirror	: J-6080-029-A
Audio level meter	

Adjustment flow chart

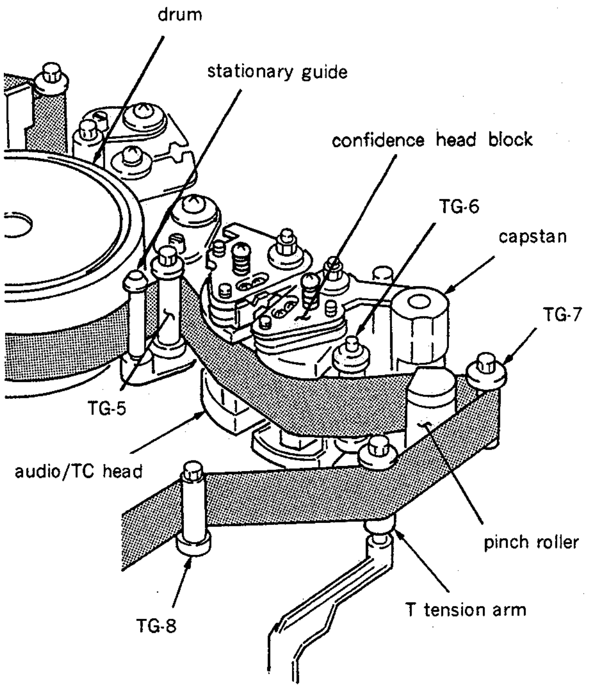

Removal of cleaning roller assembly
Removal of AU head cover
Adjustment of audio level (in REV mode)
Confirmation of audio head height
Confirmation of audio head phase
Confirmation of confidence head height
Confirmation of confidence head phase
Installation of AU head cover
Installation of cleaning roller assembly
Adjustment of cleaning roller block position


PLAY
REV ×1
audio CH-1
audio CH-2
A
B
C
D

Spec.:

$$\frac{C}{A} \geqq 0.95$$

$$\frac{D}{B} \geqq 0.95$$


drum
stationary guide
confidence head block
TG-6
capstan
TG-7
TG-5
audio/TC head
pinch roller
T tension arm
TG-8

Preparation

1. Remove a cleaning roller assembly.
   (Refer to steps (1) and (2) in Section 4-6.)
2. Remove an AU head cover.
   (Refer to step (3) in Section 4-3.)

Check

1. Connect an audio level meter as follows.
   CH-1 : AUDIO OUT CH-1 connector on the connector panel
   CH-2 : AUDIO OUT CH-2 connector on the connector panel

2. Insert an alignment tape CR8-1A PS into the unit, and play back the 10 kHz, -10 dB audio signal portion, and memorize the CH-1 and CH-2 levels. (The CH-1 level is defined as A, and the CH-2 level as B.)
3. Put the unit into REV × 1 mode.
4. Make sure that the CH-1 and CH-2 levels satisfy the specification below. (The CH-1 level is defined as C, and the CH-2 level as D.)

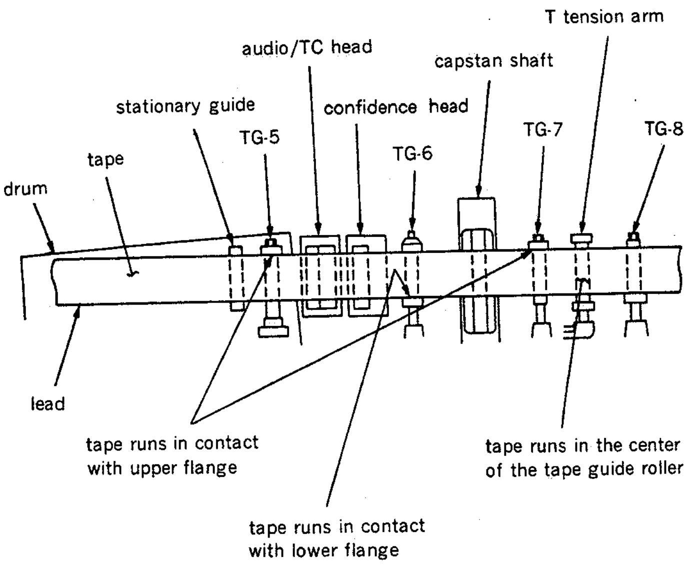
   Specification :

   CH-1 : C/A level must be more than 0.95.
   CH-2 : D/B level must be more than 0.95.

   If the specification is not satisfied, perform steps (5) and later.

Adjustment

5. Loosen the locking screw at the upper part of a TG-7 tape guide two to three turns using a tape guide adjustment driver.
6. Fine adjust the height of the TG-7 tape guide so that the specification is satisfied in REV × 1 mode.
7. Put the unit into PLAY, REV × 1, F.FWD and REW modes, and change the mode from STOP to F.FWD modes, and from STOP to REW modes.
   Using an adjustment mirror, make sure that the tape running at the flanges of the TG-6, TG-7, and T tension arm satisfy the specification in every mode.
8. Perform confirmation of audio head height. (Refer to steps (1) through (3) in Section 5-8.)
9. Perform confirmation of audio head phase. (Refer to steps (1) through (4) in Section 5-9.)
10. Perform confirmation of confidence head height. (Refer to steps (1) through (4) in Section 5-11.)
11. Perform confirmation of confidence head phase. (Refer to steps (1) through (5) in Section 5-12.)
12. Install the AU head cover. (Refer to step (31) in Section 4-3.)
13. Install the cleaning roller assembly.
    (Refer to steps (7) and (8) in Section 4-6.)
14. Perform cleaning roller block position adjustment. (Refer to Section 4-6-1.)


T tension arm
audio/TC head
capstan shaft
stationary guide
confidence head
TG-5
TG-6
TG-7
TG-8
tape
drum
lead
tape runs in contact with upper flange
tape runs in the center of the tape guide roller
tape runs in contact with lower flange

TG-6 : The lower edge of the tape runs in contact with the lower flange of the TG-6 tape guide.
However, in PLAY, F.FWD, and REW modes, the lower flange of the tape guide must not rotate.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)

TG-7 : The upper edge of the tape runs in contact with the upper flange of the TG-7 tape guide.
(If a tape curl exists, it is acceptable to the extent of 1/10 of the tape width.)

T tension arm : The tape runs in the center of the guide roller of the T tension arm.
(In modes other than PLAY, if a tape curl exists at the upper or lower flange, it is acceptable to the extent of 1/10 of the tape width.)

5-16. RF SWITCHING POSITION ADJUSTMENT (RP HEAD)

Perform this RF switching position adjustment when a video tracking adjustments (RP head) and (DT head) are performed.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Tool

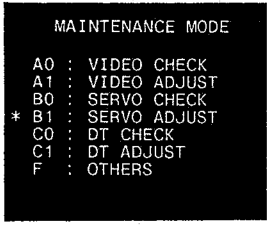
Alignment tape CR2-1B PS : 8-960-096-51

Check

1. Make sure that the TRACKING control is FIX position and the unit is in EJECT mode. (The automatic adjustment does not accept the mode other than EJECT.)
2. Select the DT SELECT switch on the front panel to OFF state.
3. Put Bit1 and Bit4 of S601 on SS-48DP board in CLOSE state. Press S302 and put the unit into maintenance mode.
4. Press the search dial to enter the jog mode, and move * mark to "B1 : SERVO ADJUST" which is displaying on the monitor screen with the search dial.
5. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.
6. Move * mark to "B110: RF SWITCHING POS." which is displaying on the monitor screen with the search dial.
7. Press S302 on SS-48DP board to execute "RF SWITCHING POS." menu.
8. Move * mark to "AUTO ADJUST" which is displaying on the monitor screen with the search dial.
9. Press S302 on SS-48DP board to execute "AUTO ADJUST" menu.
10. Confirm that the message "SET CR2-1 ALIGNMENT TAPE AND PUSH PLAY KEY" is displayed on the monitor screen.
11. Insert an alignment tape CR2-1B PS and press the PLAY button.
12. Make sure that the message "COMPLETE" is displayed on the monitor screen.
    When "COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.
13. Move * mark to "B117: NV RAM CONTROL" which is displaying on the monitor screen with the search dial.

S601-1, 4/SS-48DP : CLOSE

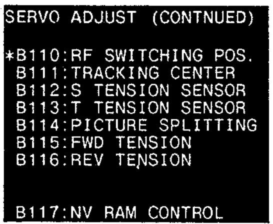
↓ press S302



```
   MAINTENANCE MODE

 A0 : VIDEO CHECK
 A1 : VIDEO ADJUST
 B0 : SERVO CHECK
* B1 : SERVO ADJUST
 C0 : DT CHECK
 C1 : DT ADJUST
 F  : OTHERS
```

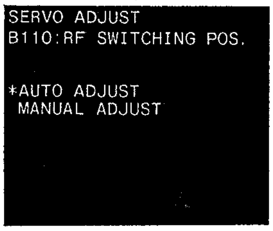
select with search dial

↓ press S302



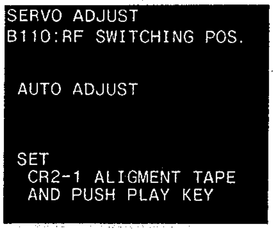
```
SERVO ADJUST (CONTNUED)

*B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION

 B117:NV RAM CONTROL
```

↓ press S302



```
SERVO ADJUST
B110:RF SWITCHING POS.

*AUTO ADJUST
 MANUAL ADJUST
```

↓ press S302

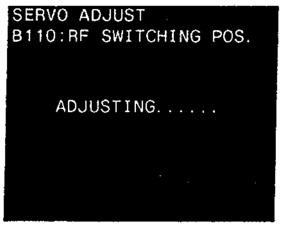


```
SERVO ADJUST
B110:RF SWITCHING POS.

 AUTO ADJUST


 SET
  CR2-1 ALIGMENT TAPE
  AND PUSH PLAY KEY
```

↓

insert CR2-1B PS, and
press PLAY button.

↓



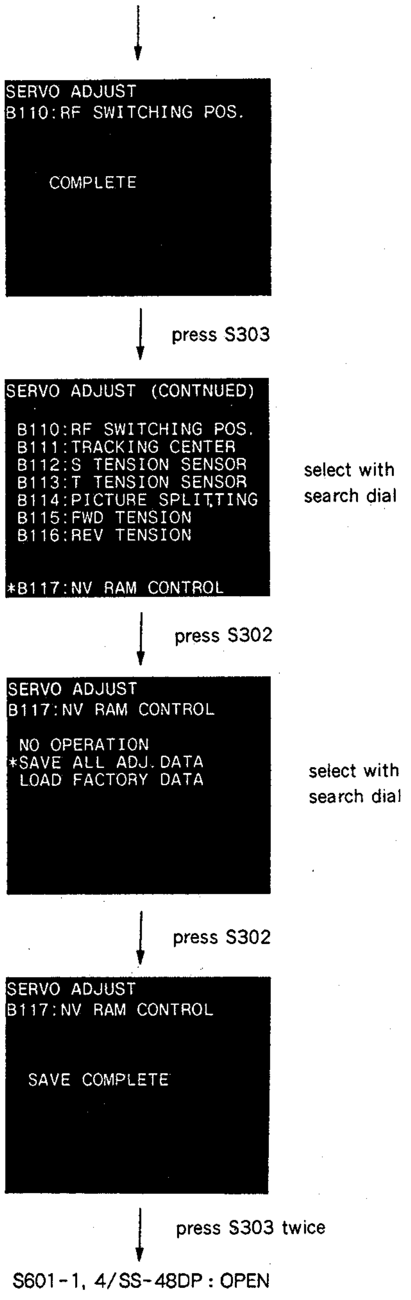
```
SERVO ADJUST
B110:RF SWITCHING POS.

    ADJUSTING......
```

↓

14. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
15. Move ∗ mark to "SAVE ALL ADJ. DATA" with the search dial.
16. Press S302 on SS-48DP board. Data will be stored on the NV RAM.
17. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.

Note: When "INCOMPLETE" appears on the monitor screen in step (12), press S303 on SS-48DP board to return to the menu screen.
After that, press the EJECT button, take out the alignment tape, and make sure that it is CR2-1B PS.

18. Press the EJECT button and take out the alignment tape.
19. Turn the POWER to OFF and put Bit4 of S601 on SS-48DP board to OPEN state.
20. After adjustment, perform Section 5-17. RF switching position adjustment (DT head).



```
SERVO ADJUST
B110:RF SWITCHING POS.

   COMPLETE
```

```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION

*B117:NV RAM CONTROL
```

```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

```
SERVO ADJUST
B117:NV RAM CONTROL

  SAVE COMPLETE
```

5-17. RF SWITCHING POSITION ADJUSTMENT (DT HEAD)

Perform this switching position (DT head) adjustment when a video tracking adjustment is performed. Before performing this adjustment, RF switching position (RP head) adjustment is already completed.

Preparation

Connect a video monitor with MONITOR connector, and display characters.

Tool

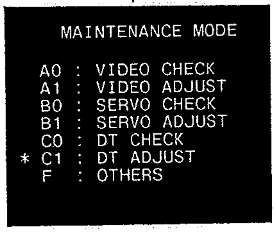
Alignment tape CR2-1B PS : 8-960-096-51

Check

1. Make sure that TRACKING control is FIX position and the unit is in EJECT mode. (The automatic adjustment does not accept the mode other than EJECT.)
2. Select the DT SELECT switch on the front panel to VAR state.
3. Put Bitsl, 2 and 5 of S2 on DT-28 board to ON state.
4. Press S302 on SS-48DP board and put the unit into maintenance mode.
5. Press the search dial to enter the jog mode, and move * mark to "Cl : DT ADJUST" which is displaying on the monitor screen with the search dial.
6. Press S302 on SS-48DP board to select "DT ADJUST" mode.
7. Move * mark to "C12 : DT Sw. POSITION" which is displaying on the monitor screen with the search dial.
8. Press S302 on SS-48DP board to execute "DT Sw. POSITION" menu.
9. Make sure that the * mark is positioned to "Start auto adjust" which is displaying on the monitor screen.
10. Press S302 on SS-48DP board.
11. Insert an alignment tape CR2-1B PS and press PLAY button.
12. Press S302 on SS-48DP board again and execute "auto adjust" menu.
13. Make sure that the message "ADJUST COMPLETE" is displayed at the lower portion on the monitor screen.
    When "ADJUST COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.
14. Move * mark to "C15 : Save adjust data" which is displaying on the monitor screen with the search dial.
15. Press S302 on SS-48DP board to select "Save adjust data" menu.

DT SELECT sw/FRONT PANEL : VAR
S2-1, 2, 5/DT-28 : ON

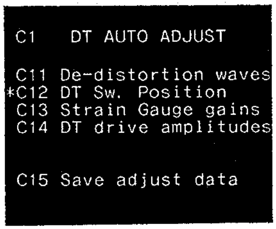
press S302



```
MAINTENANCE MODE

  A0 : VIDEO CHECK
  A1 : VIDEO ADJUST
  B0 : SERVO CHECK
  B1 : SERVO ADJUST
  C0 : DT CHECK
* C1 : DT ADJUST
  F  : OTHERS
```

select with search dial

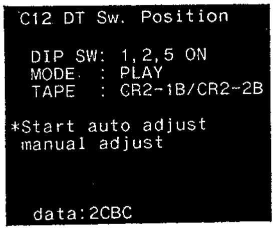
press S302



```
C1   DT AUTO ADJUST

 C11 De-distortion waves
*C12 DT Sw. Position
 C13 Strain Gauge gains
 C14 DT drive amplitudes

 C15 Save adjust data
```

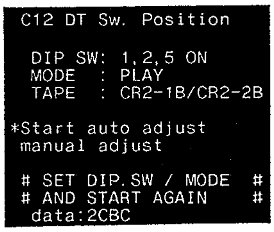
select with search dial

press S302



```
 C12 DT Sw. Position

  DIP SW: 1,2,5 ON
  MODE  : PLAY
  TAPE  : CR2-1B/CR2-2B

*Start auto adjust
 manual adjust


  data:2CBC
```

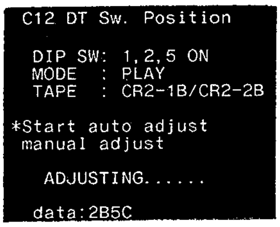
press S302



```
 C12 DT Sw. Position

  DIP SW: 1,2,5 ON
  MODE  : PLAY
  TAPE  : CR2-1B/CR2-2B

*Start auto adjust
 manual adjust

 # SET DIP.SW / MODE  #
 # AND START AGAIN    #
  data:2CBC
```

insert CR2-1B PS, and
press PLAY button.

press S302

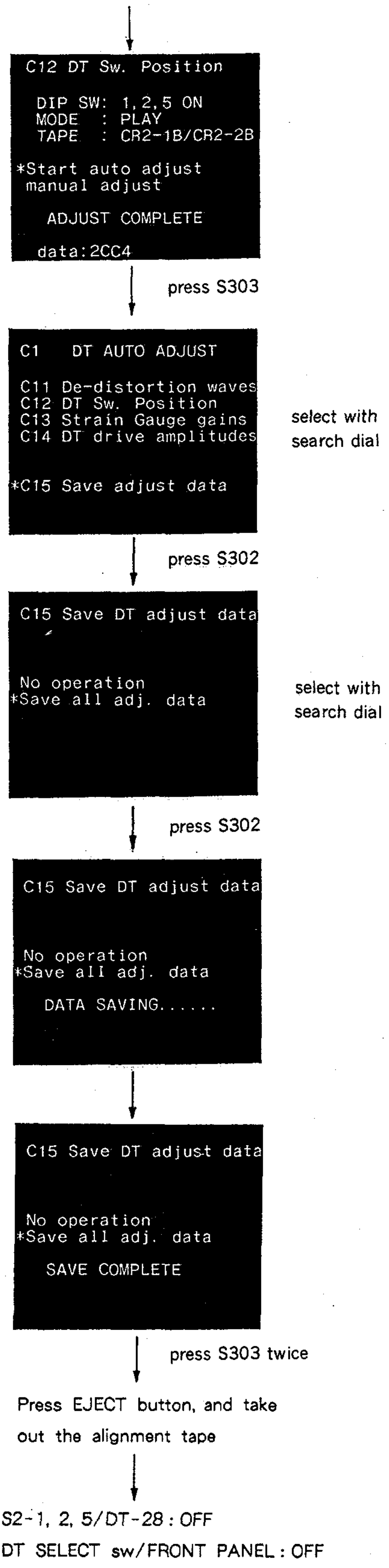


```
 C12 DT Sw. Position

  DIP SW: 1,2,5 ON
  MODE  : PLAY
  TAPE  : CR2-1B/CR2-2B

*Start auto adjust
 manual adjust

  ADJUSTING......

  data:2B5C
```

16. Move * mark to "Save all adj. data" which is displaying on the monitor screen with the search dial.
17. Press S302 on SS-48DP board. Data will be stored on the NV RAM.
18. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the menu screen.

    Note 1:When "INCOMPLETE" appears on the monitor screen in step (13), press S303 on SS-48DP board to return to the menu screen.
    After that, press EJECT button, take out the alignment tape, and make sure that it is CR2-1B PS.

    Note 2: When the alignment tape is CR2-1B PS, perform "MANUAL ADJUST" referring the electrical adjustment.
19. Press EJECT button and take out the alignment tape.
20. Turn OFF the POWER swich, and reset Bitsl, 2 and 5 of S2 on DT-28 board to OFF state.
21. Select the DT select switch on the front panel to OFF state.



```
C12 DT Sw. Position

 DIP SW: 1,2,5 ON
 MODE  : PLAY
 TAPE  : CR2-1B/CR2-2B

*Start auto adjust
 manual adjust

   ADJUST COMPLETE

  data:2CC4
```

press S303

```
C1   DT AUTO ADJUST

C11 De-distortion waves
C12 DT Sw. Position
C13 Strain Gauge gains
C14 DT drive amplitudes

*C15 Save adjust data
```

select with search dial

press S302

```
C15 Save DT adjust data


No operation
*Save all adj. data
```

select with search dial

press S302

```
C15 Save DT adjust data


No operation
*Save all adj. data
  DATA SAVING......
```

```
C15 Save DT adjust data


No operation
*Save all adj. data
  SAVE COMPLETE
```

press S303 twice

Press EJECT button, and take out the alignment tape

S2-1, 2, 5/DT-28 : OFF
DT SELECT sw/FRONT PANEL : OFF

5-18. VIDEO HEAD DIHEDRAL CHECK

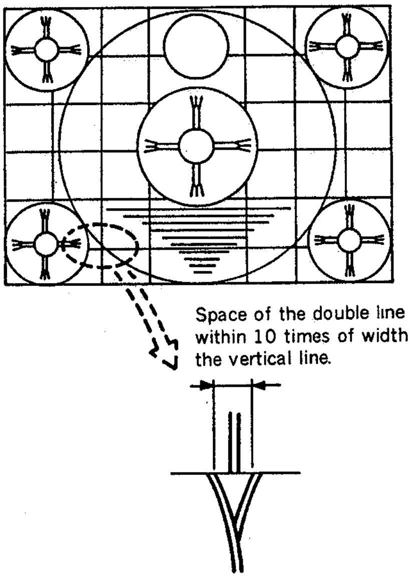
The video head dihedral of an upper drum assembly and drum assembly for service part is precisely adjusted at the factory. No adjustment is thus required. Perform only the check.

Tools

Alignment tape CR5-2A PS : 8-960-098-44
Monitor TV

Check flow chart

Confirmation of video head dihedral


Space of the double line is within 10 times of width of the vertical line.

Check

1. Connect a monitor TV to TP405 on MDM-5P board.
2. Select the DT SELECT switch on the front panel to OFF state.
3. Insert an alignment tape CR5-2A PS into the unit and play back the monoscope signal portion.
4. Make sure if the vertical line of the monoscope signal just beneath a switching pulse is played back in double lines instead of a single line.
   Make sure that the space of the double line is within 10 times of width of the vertical line.
5. Select the DT SELECT switch to VAR state.
6. Make sure that if the vertical line of the monoscope signal just beneath a switching pulse is played back in double lines instead of a single line.
   Make sure that the space of the double line is within 10 times of width of the vertical line.
7. Reset the DT SELECT switch to OFF state.

5-19. PICTURE SPLITTING COMPENSATION ADJUSTMENT

This picture splitting compensation adjustment is usually not required.
Picture splitting is rarely detected on the monitor TV that is connected to the connector on the connector panel. Perform this adjustment only when the picture splitting is detected. The picture splitting is the phenomenon shown in the figure.

Tools

Conventional monitor TV for checking
Alignment tape CR5-2A PS : 8-960-098-44
For adjustment purpose, monitor TV (Use a monitor whose AFC lock is slow.)

Adjustment flow chart

Adjustment of picture splitting compensation

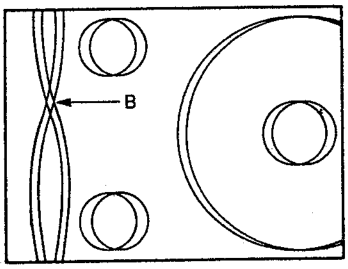
Check

1. Connect a conventional monitor TV to the connector on the connector panel.
2. Insert an alignment tape CR5-2A PS into the unit and play back the monoscope signal portion.
3. Check whether picture splitting is detected on the monitor TV.

Specification : 1.5 μs or less
If picture splitting is detected, perform steps (4) and later.

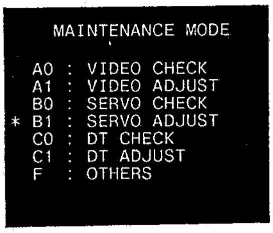
Adjustment

4. Make sure that the TRACKING control is FIX position and the unit is in EJECT mode.
5. Select the DT SELECT switch on the front panel to OFF state.
6. Connect a monitor TV for adjustment purpose to TP405 on MDM-5P board.
7. Connect a conventional monitor TV with MONITOR connector on the connector panel.
8. Put the monitor TV into H DELAY, AFC FAST, and SYNC INT modes.
9. Make sure that the unit is in EJECT mode.
10. Put Bit4 of S601 on SS-48DP board to CLOSE state. Press S302 and put the unit into maintenance mode.
11. Press the search dial to enter the jog mode, and move * mark to "B1 : SERVO ADJUST" which is displaying on the monitor screen with the search dial.
12. Press S302 on SS-48DP board to select "SERVO ADJUST" mode.



S601-4/SS-48DP : CLOSE

↓ press S302

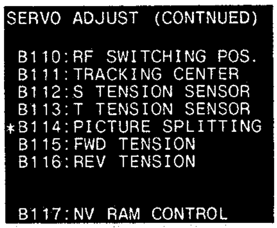

MAINTENANCE MODE

A0 : VIDEO CHECK
A1 : VIDEO ADJUST
B0 : SERVO CHECK
* B1 : SERVO ADJUST
C0 : DT CHECK
C1 : DT ADJUST
F : OTHERS

select with search dial

↓ press S302

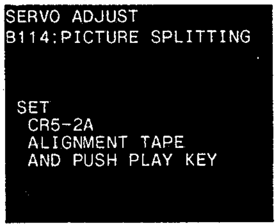
13. Move ∗ mark to "B114: PICTURE SPLITTING" in the menu which is displaying on the monitor screen with the search dial.
14. Press S302 on SS-48DP board to execute "PICTURE SPLITTING" menu.
15. Insert an alignment tape CR5-2A PS into the unit and play back the monoscope signal portion.
16. Mark the "B" position shown in the figure on the monitor screen with felt pen.
17. Press S302 on SS-48DP board.
18. Turn the search dial so that the picture splitting cross-point position of a picture played back on the monitor screen coincides with the position marked in step (16).
19. Press S302 on SS-48DP board.
20. Turn the search dial so that minimize the picture splitting, and press S302 on SS-48DP board.
21. Make sure that the message "COMPLETE" is displayed on the monitor screen that is connected with MONITOR connector.
22. When "COMPLETE" is displayed on the monitor screen, press S303 on SS-48DP board to return to the menu screen.
23. Move ∗ mark to "B117 : NV RAM CONTROL" which is displaying on the monitor screen with the search dial.
24. Press S302 on SS-48DP board to execute "NV RAM CONTROL" menu.
25. Move ∗ mark to "SAVE ALL ADJ. DATA" with the search dial.
26. Press S302 on SS-48DP board. Data will be stored on the NV RAM.
27. When "SAVE COMPLETE" is displayed on the monitor screen, press S303 twice on SS-48DP board to return to the mode screen.



```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
*B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION


 B117:NV RAM CONTROL
```

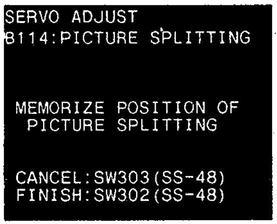
select with search dial

press S302



```
SERVO ADJUST
B114:PICTURE SPLITTING



 SET
  CR5-2A
  ALIGNMENT TAPE
  AND PUSH PLAY KEY
```

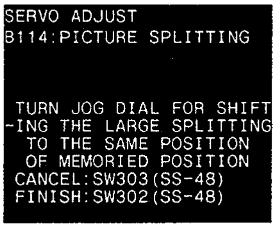
insert CR5-2A PS, and press PLAY button.



```
SERVO ADJUST
B114:PICTURE SPLITTING


 MEMORIZE POSITION OF
  PICTURE SPLITTING


 CANCEL:SW303(SS-48)
 FINISH:SW302(SS-48)
```

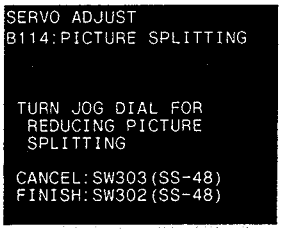
mark the "B" position on the monitor screen

press S302



```
SERVO ADJUST
B114:PICTURE SPLITTING



 TURN JOG DIAL FOR SHIFT
-ING THE LARGE SPLITTING
  TO THE SAME POSITION
  OF MEMORIED POSITION
 CANCEL:SW303(SS-48)
 FINISH:SW302(SS-48)
```

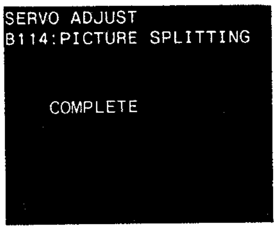
press S302



```
SERVO ADJUST
B114:PICTURE SPLITTING



 TURN JOG DIAL FOR
  REDUCING PICTURE
  SPLITTING

 CANCEL:SW303(SS-48)
 FINISH:SW302(SS-48)
```

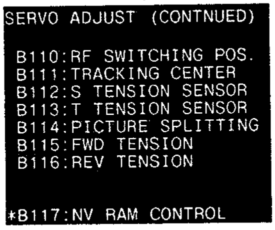
turn the search dial, and perform adjustment

press S302



```
SERVO ADJUST
B114:PICTURE SPLITTING

   COMPLETE
```

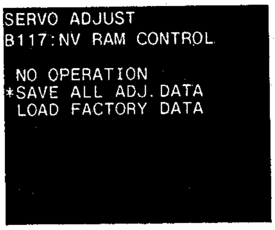
press S303



```
SERVO ADJUST (CONTNUED)

 B110:RF SWITCHING POS.
 B111:TRACKING CENTER
 B112:S TENSION SENSOR
 B113:T TENSION SENSOR
 B114:PICTURE SPLITTING
 B115:FWD TENSION
 B116:REV TENSION


*B117:NV RAM CONTROL
```

select with search dial

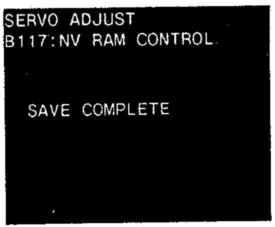
press S302



```
SERVO ADJUST
B117:NV RAM CONTROL

 NO OPERATION
*SAVE ALL ADJ.DATA
 LOAD FACTORY DATA
```

select with search dial

press S302



```
SERVO ADJUST
B117:NV RAM CONTROL


  SAVE COMPLETE
```

press S303 twice

S601-4/SS-48DP : OPEN

SECTION 6
GENERAL INFORMATION FOR ALIGNMENT

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RV1109	Y CARRIER (METAL)	10-16
RV1110	Y CARRIER (OXIDE)	10-18
RV1111	Y WHITE CLIP (METAL)	10-14
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RV1114	Y DARK CLIP (OXIDE)	10-15
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RV1513	C DARK CLIP (METAL)	10-23
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RV1515	C MODULATOR CARRIER BALANCE (METAL)	10-29
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PA-109 Board

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RV1	SEARCH DIAL B ASSY SENS. DUTY	8-8
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LV411	CH-2 BIAS TRAP	9-17
LV452	CH-2 INSERT BIAS TRAP	9-18
LV501	CH-1 BIAS RESP.	9-18
LV601	CH-2 BIAS RESP.	9-18
RV1	CH-A Y OVERALL FREQ. RESPONSE (METAL)	10-115
RV2	CH-A Y OVERALL FREQ. RESPONSE (OXIDE)	10-118
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RV452	CH-2 R/P HEAD PB FREQ. RESP. (OXIDE	9-13
RV501	CH-1 CONFI HEAD FREQ. (DOLBY OFF)	9-12, 19
RV502	CH-1 CONFI HEAD FREQ. (DOLBY OFF) (OXIDE)	9-12, 19
RV601	CH-2 CONFI HEAD FREQ. (DOLBY OFF)	9-12, 19
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T401	CH-2 BIAS TUNE	9-17

SS-48DP Board

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TBC-17P, DUS-494 Boards

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LV400	C NORMAL VCO	10-94
RV150	Y PB LEVEL (METAL)	10-100
RV151	R-Y PB LEVEL (METAL)	10-100
RV152	BLACK LEVEL	10-97
RV201	A/D CLAMP LEVEL	10-98
RV300	Y IMPACT ERROR	10-97
RV301	TBC VCO (HIGH SPEED SEARCH) (TRO)	10-110
RV302	TBC VCO (HIGH SPEED SEARCH) (TRG)	10-109
RV303	PB VIDEO PHASE	11-9
RV304	Y WRITE CLOCK FREQ.	10-
RV400	C IMPACT ERROR	10-97
RV401	PB Y/R-Y DELAY (OXIDE)	11-11
RV403	PB Y/R-Y DELAY (METAL)	11-10
RV404	C WRITE CLOCK FREQ.	10-96
RV500	MONITOR PB Y/B-Y PHASE	11-13
RV501	MONITOR PB Y/R-Y DELAY	11-14
RV502	MONITOR PB Y/B-Y DELAY	11-14
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RV504	MONITOR B-Y PB OUTPUT LEVEL (METAL)	10-102
RV505	MONITOR R-Y PB OUTPUT LEVEL (METAL)	10-102
RV702	OUTPUT SCH	11-16
RV704	REF CF PULSE	11-7
RV706	PB VISC PHASE	11-
RV708	NOISE REDUCE (POSI EDGE)	11-18
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RV1/DUS-494	OUTPUT SCH	11-16

SECTION 7

POWER SUPPLY AND SYSTEM CONTROL ALIGNMENT

(Equipment Required)

- Digital Voltmeter (ADVANTEST TR6845)
- Picture Monitor
- Blank Tape (metal) BCT-20M

  NOTE: "Blank Tape" indicates a cassette tape on which no video/audio signals are recorded. (An CTL signal is only recorded.)

  "How to make a blank tape"

  1) Set TC EXT/INT switch on the subcontrol panel to EXT.
  2) Set REC INHIBIT switch on the subcontrol panel to OFF.
  3) Set AUDIO INPUT LEVEL CH-1 and CH-2 switches on the connector panel to HIGH, and AUDIO INPUT 600-ohm termination switch (CH-1 and CH-2) to ON.
  4) Pull the REC level controls (CH-1 to CH-4), and turn fully clockwise (make minimum).
  5) Insert a cassette tape (BCT-20M (METAL) or BCT-20G (OXIDE)).
  6) Put the unit into REC mode from tape beginning to end. (The CTL signal is only recorded.)
- Alignment Tape CR5-2A PS (part No. 8-960-098-44)

  Contents

TIME (min s)	VIDEO TRACK
0:00 to 3:00	75% Color-bar
3:00 to 6:00	60% Multi Burst Y: 0.5, 1, 2, 3, 4.1, 4.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz
6:00 to 9:00	50% Bowtie & 10T
9:00 to 11:00	Pulse & Bar
11:00 to 13:00	Quad Phase
13:00 to 15:00	C-Monoscope Switching position is shifted.

7-1. SWITCHING REGULATOR VOLTAGE ADJUSTMENT

Preparations for adjustment

- .Set bit1 through bit8 of S601 on SS-48D board (B-1) to ON.
- .Extend SS-48D board with extension board EX-286.
- .Turn POWER to ON.

Specifications and adjustment

Confirm the voltages of the following point using a digital voltmeter.

CN139-46Apin: +5.10 ± 0.25 V
CN139-44pin: +8.1 +1.0/-0.5 V
CN139-42Apin: -5.10 +0.25/-0.35 V
CN141-5Apin: -13.00 ± 0.75 V
CN141-4Apin: +13.0 ± 0.5 V

NOTE: When confirming, be carefull not to short between connector pins.

After confirming is completed, reset the bit1 through bit8 of S601 to OFF.

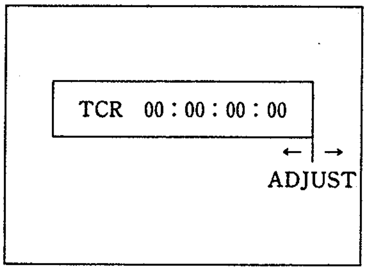
7-2. CHARACTER POSITION ADJUSTMENT

Preparations for adjustment

Step-1

- .Connect the picture monitor to MONITOR Y OUTPUT connector.
- .CHARACTER switch on the sub control panel is set to ON.
- .CTL/TC/U-BIT switch on the control panel to TC.
- .Play back the C-monoscope signal portion (13:00 to 15:00) of an alignment tape CR5-2A.

Specifications and adjustment



Adjust the TC character display at the center of the screen.

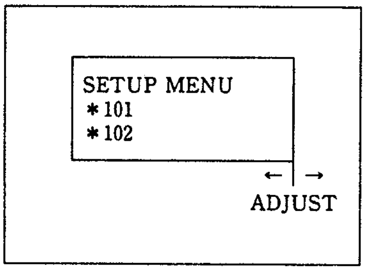
Adjustment: CV401/SS-48D (M-1)

Preparations for adjustment

Step-2

.Press the SYSTEM SET-UP MENU button on the sub control panel once.

Specifications and adjustment



Adjust the SETUP MENU character display at the center of the screen.

Adjustment: CV402/SS-48D (M-1)

After adjustments are completed, press the SYSTEM SET-UP MENU button.

SECTION 8

SERVO SYSTEM ALIGNMENT

(Equipment Required)

- .Oscilloscope (TEKTRONIX 2445 or equivalent)
- .Picture Monitor
- .Blank Tape (oxide) BCT-20G
- .Blank Tape (metal) BCT-20M

NOTE: "Blank Tape" indicates a cassette tape on which no video/audio signals are recorded. (An CTL signal is only recorded.)

"How to make a blank tape"

1) Set TC EXT/INT switch on the subcontrol panel to EXT.
2) Set REC INHIBIT switch on the subcontrol panel to OFF.
3) Set AUDIO INPUT LEVEL CH-1 and CH-2 switches on the connector panel to HIGH, and AUDIO INPUT 600-ohm termination switch (CH-1 and CH-2) to ON.
4) Pull the REC level controls (CH-1 to CH-4), and turn fully clockwise (make minimum).
5) Insert a cassette tape (BCT-20M (METAL) or BCT-20G (OXIDE)).
6) Put the unit into REC mode from tape beginning to end. (The CTL signal is only recorded.)

- .Alignment Tape CR2-1B PS (part No. 8-960-096-51)

Contents

VIDEO TRACK	AUDIO TRACK	TIME CODE TRACK	CTL TRACK
Y: 4 MHz Signal C: 5 MHz Signal	Blank Blank	Blank Blank	CTL CTL

. Alignment Tape CR5-1BPS (part No. 8-960-096-91)
Contents

TIME (min s)	VIDEO TRACK	AFM
0:00 to 2:00	RF Sweep Marker 1, 2, 4, 6, 8, 10, 12 MHz	No Signal
2:00 to 5:00	60% H Sweep (CTDM) Marker 0.5, 1, 2, 3, 4, 5 MHz	No Signal
5:00 to 8:00	Pulse & Bar (CTDM)	No Signal
8:00 to 11:00	Multi Burst Y: 0.5, 1, 2, 4.5, 5.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz	No Signal
11:00 to 14:00	Pulse & Bar	No Signal
14:00 to 16:30	100% Color-bar	400 Hz Sine Wave 25 kHz Deviation
16:30 to 17:00	100% Color-bar	400 Hz Sine Wave 75 kHz Deviation
17:00 to 19:00	50% Bowtie & 10T	No Signal
19:00 to 22:00	Line 17A	No Signal
22:00 to 24:00	Quad Phase	No Signal
24:00 to 26:00	50% Flat Field	No Signal
26:00 to 28:00	100% Color-bar with Dropout	No Signal
28:00 to 30:00	Composite H Sweep with VISC	No Signal

.Alignment Tape CR5-2A PS (part No. 8-960-098-44)
Contents

TIME (min s)	VIDEO TRACK
0:00 to 3:00	75% Color-bar
3:00 to 6:00	60% Multi Burst Y: 0.5, 1, 2, 3, 4.1, 4.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz
6:00 to 9:00	50% Bowtie & 10T
9:00 to 11:00	Pulse & Bar
11:00 to 13:00	Quad Phase
13:00 to 15:00	C-Monoscope Switching position is shifted.

(Switch Setting)
Following setting should not be changed in position unless otherwise specified.

<Upper Control Panel>
REMOTE/LOCAL: LOCAL
AUDIO MONITOR (CH-1/3, ST, CH-2/4): ST
AUDIO MONITOR (LNG, AFM): LNG
REC level control (CH-1 to CH-4): PRESET (push)
PB level control (CH-1 to CH-4): PRESET (push)
HEADPHONES: MAX (turn to fully counterclockwise)
TRACKING: Center Click

<Lower Control Panel>
DT SELECT: OFF
CTL/TC/U-BIT: CTL
PB/PB/EE: PB
CONFI: OFF

<Sub Control Panel>
TC EXT/INT: INT
REC INHIBIT: OFF
DIGITAL AUDIO INPUT: SERIAL V/A
DIGITAL AUDIO EMPHASIS: OFF
AFM INPUT: CH-1/2
DOLBY NR: ON
TBC CONTROL: LOCAL
VIDEO: PRESET
CHROMA: PRESET
SET UP: PRESET
Y/C DELAY: PRESET
CAPSTAN LOCK: 2/4FD

<System Control Panel>
VITC/AUTO/LTC: LTC
VITC: ON
TC GENERATOR:
REGEN/PRESET: PRESET
REC RUM/FREE RUN: FREE RUN
AUDIO LIMITER: OFF
VTR CONTROL: INT
NDF/DF: DF
ID PRESET: OFF
LEVEL REF: OFF
TBC REF: REF
CHARACTOR: ON
SYNCHRONIZE: ON

<Connector panel>
AUDIO INPUT LEVEL (CH-1 to CH-4): HIGH
AUDIO INPUT 600-ohm (CH-1 to CH-4): OFF
REF VIDEO INPUT: ON

TBC-17P Board Switch Setting>
S1 Bit-1(J-1): ON
S1 Bit-2(J-1): OFF
S1 Bit-3(J-1): OFF
S1 Bit-4(J-1): OFF
S1 Bit-5(J-1): OFF
S1 Bit-6(J-1): OFF
S1 Bit-7(J-1): OFF
S1 Bit-8(J-1): OFF

<DIF-11P Board Switch Setting>
S102 (C-1): OFF
S801 (J-1): OFF
S800 (H-1): 0
<SS-48DP Board Switch/Short Pin Setting>
S2 Bit-1(P-1): ON
S2 Bit-2(P-1): OFF
S2 Bit-3(P-1): OFF
S2 Bit-4(P-1): OFF
S2 Bit-5(P-1): OFF
S2 Bit-6(P-1): OFF
S2 Bit-7(P-1): OFF
S2 Bit-8(P-1): OFF
S601 Bit-1(B-1): ON
S601 Bit-2(B-1): ON
S601 Bit-3(B-1): ON
S601 Bit-4(B-1): ON
S601 Bit-5(B-1): ON
S601 Bit-6(B-1): ON
S601 Bit-7(B-1): ON
S601 Bit-8(B-1): ON
S301 (K-1): 1
S201 (Q-1): SPARE
COR5(Q-4) (For UC/J): SHORT
COR6(Q-4):(For UC/J): SHORT
COR7(Q-4):(For J): SHORT
COR3(Q-4):(For uc): SHORT
COR8(Q-4):(For UC/J): SHORT
<MDM-5P Board Switch/Short Pin Setting>
S401 (B-1): OFF
S801 (G-1): OFF
S901 (L-1): All OFF
S902 (K-1): All OFF
COR101(B-7): SHORT
COR102(B-7): OPEN
COR501(F-7): SHORT
COR502(F-7): OPEN
S1601(E-4): Right
S1602(F-4): Right
S1603(E-1): Up
S1604(F-1): Right
<DT-28 Board Switch/Short Pin Setting>
S2(B-1): All OFF
<AU-145 Board Short Pin Setting>
COR101(G-2): SHORT
COR201(F-2): SHORT
COR301(D-2): SHORT
COR401(C-2): SHORT
COR501(C-2): SHORT
COR601(A-2): SHORT
<AU-146P Board Switch/Short Pin Setting>
S901 (C-1): OFF
COR901(A-1): SHORT

<AU-147P Board Short Pin Setting>
COR901(G-3): SHORT
COR671(A-5): SHORT
COR651(A-6): SHORT
COR631(A-6): SHORT

<AFM-8 Board Switch Setting>
S1 (G-1): All OFF

<RP-53P Board Switch Setting>
S351 Bit-1: ON
S351 Bit-2: ON
S351 Bit-3: OFF
S351 Bit-4: OFF
S451 Bit-1: ON
S451 Bit-2: ON
S451 Bit-3: OFF
S451 Bit-4: OFF
S501 Bit-1: ON
S501 Bit-2: ON
S501 Bit-3: OFF
S501 Bit-4: OFF
S601 Bit-1: ON
S601 Bit-2: ON
S601 Bit-3: OFF
S601 Bit-4: OFF

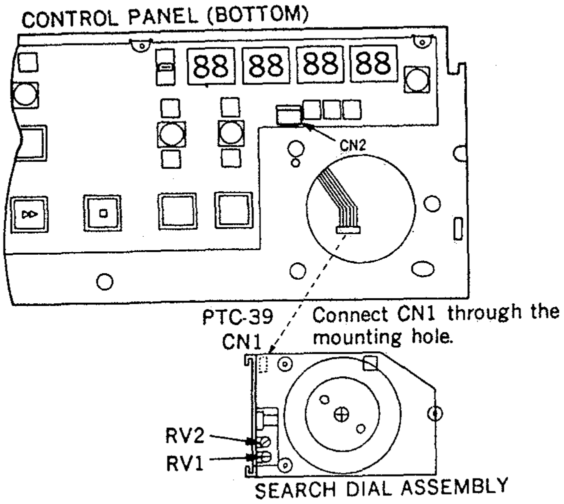
<DP-128 Board Switch Setting>
S101 (C-1): VU
S102 (C-1): OFF

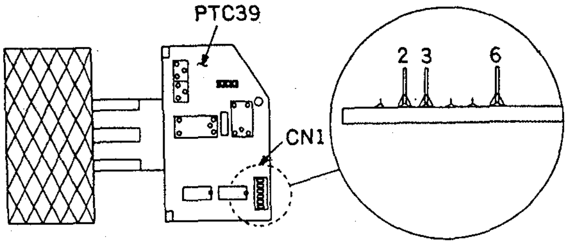
8-1. SEARCH DIAL ASSEMBLY SENSOR DUTY ADJUSTMENT

.NOTE: This adjustment should be only performed if any parts are replaced on PTC-39 board or if any RV is moved unintentionally.

Preparation:

(1) Remove the lower control panel assembly.
(2) Remove the rubber of the search dial. Then remove the screw on the dial and pull out the dial knob.
(3) Remove three screws on the lower control panel and remove the search dial.
(4) Remove one screw on the side of the search dial and remove the plastic cover.
(5) Install the lower control panel on the unit.
(6) Install the dial and rubber.
(7) Connect the harness to the connector CN1 on PTC-39 board passing through the hole of the control panel.
(8) Solder the test terminals for connecting a probe to CN1-2pin, 3pin and 6pin on PTC-39 board.
(9) After adjustment is completed, install the dial and the panel.





Preparations for adjustment

Step-1

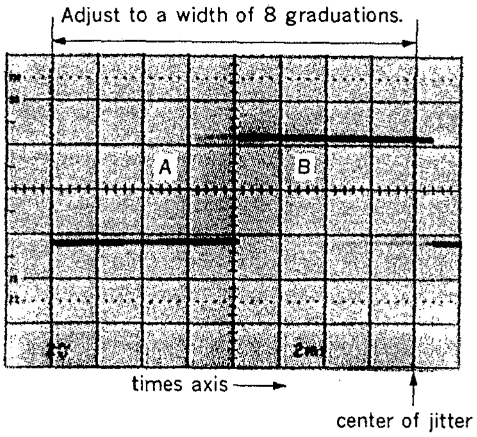
.Connect the probe of an oscilloscopeto to CN1-2pin on PTC-39 board of the search dial assembly, and connect the GND probe to CN1-6pin.

.Press the search dial to put the unit into JOG mode.

.Adjust one cycle of the waveform to 8 scales on the oscilloscope using H width control of the oscilloscope.

.Turn the search dial in the reverse direction at the constant speed.

Specifications and adjustment



A : B = 3.5 : 4.5 (± 5%)

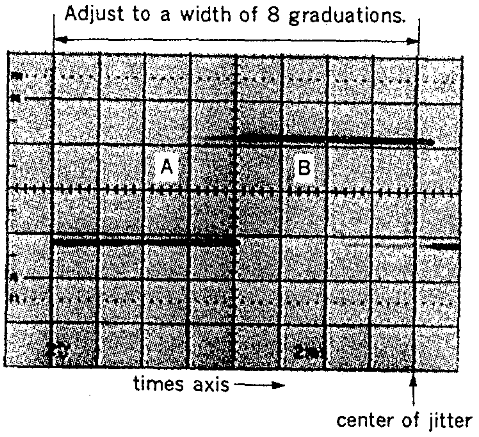
Adjustment: RV2/PTC-39

Preparations for adjustment

Step-2

- .Connect the probe of an oscilloscopeto to CN1-3pin on PTC-39 board of the search dial assembly, and connect the GND probe to CN1-6pin.
- .Press the search dial to put the unit into JOG mode.
- .Adjust one cycle of the waveform to 8 scales on the oscilloscope using H width control of the oscilloscope.
- .Turn the search dial in the forward direction at the constant speed.

Specifications and adjustment



A : B = 3.5 : 4.5 (± 5%)

Adjustment: RV1/PTC-39

8-2. DE-DISTORTION WAVE ADJUSTMENT

- In this adjustment, two kinds of adjustment methods are existed. One is auto adjustment, another is manual adjustment.
- Perform the auto adjustment first, and then if the "ADJUST INCOMPLETE" is displayed on the monitor screen, perform the manual adjustment.
- The auto adjustment procedures are deleted in this section, please refer to Section 2-21-6. DT system adjustment mode (C1: DT ADJUST).

8-2-1. De-distortion Wave Manual Adjustment

Preparations for adjustment

- Connect the monitor TV to MONITOR Y OUTPUT connector on the connector panel.
- Confirm the connector CN2 on SR-52 board is connected.
- Set switches S2-bits1, 2, 4 and 5 on DT-28 board (B-1) to ON.
- Confirm the unit is in the eject mode.
- Turn the POWER to ON, and confirm D10 on DT-28 board (A-1) turns OFF after several seconds later.
- Return switch S2-bit4 on DT-28 board to OFF.
- Press switch S302 on SS-48DP board.
  Then the unit put into the maintenance mode, and seven kinds of mode display on the monitor screen.
- Press the search dial to put into jog mode, and move * mark to "C1: DT ADJUST" displaying on the monitor screen with the search dial.
- Press switch S302 on SS-48DP board.
  By this operation, "DT ADJUST" item is selected.
  "DT ADJUST" menu will display on the monitor screen.
- Move * mark to "C11 De-distortion waves" with the search dial (in jog mode).
- Press switch S302 on SS-48DP board, and execute the "De-distortion waves" item.

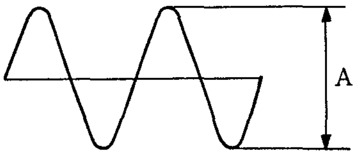
Specifications and adjustment

Step-1

- Move * mark to "Ach manual adjust" with the search dial.
- Press switch S1 on DT-28 board (A-1), and execute the de-distortion mode.
- Observe the waveform at TP204 on DT-28 board (F-1).
- While pressing the search button, turn the search dial to meet the specification of the level of the waveform.

TP204/DT-28(F-1)

A = 7.9 ± 0.2 Vp-p



TRIG: INT

Specifications and adjustment

Step-2

- .Move * mark to "Bch manual adjust" with the search dial.
- .Perform the adjustment as the same manner of Step-1.

CH-B: TP208/DT-28(F-1)

A = 7.9 ± 0.2 Vp-p

TRIG: INT

Specifications and adjustment

Step-3

- .Move * mark to "C15: Save adjust data" displaying on the monitor screen with the search dial.
- .Press switch S302 on SS-48DP board.
  By this operation, "Save adjust data" menu is selected.
- .Move * mark to "Save all adj. data" with the search dial (in jog mode).
- .Press switch S302 on SS-48DP board, and execute the "Save adjust data" menu.
- .After about six seconds later, when the save operation is completed, "SAVE COMPLETE" is displayed.
- .After confirm the message of "SAVE COMPLETE", press S303 on SS-48DP board three times, then the maintenence mode is finished.
- .After saving data, return the switches S2-bits1, 2 and 5 on DT-28 board to OFF.

8-2. DE-DISTORTION WAVE ADJUSTMENT

- .In this adjustment, two kinds of adjustment methods are existed. One is auto adjustment, another is manual adjustment.
- .Perform the auto adjustment first, and then if the "ADJUST INCOMPLETE" is displayed on the monitor screen, perform the manual adjustment.
- .The auto adjustment procedures are deleted in this section, please refer to Section 2-21-6. DT system adjustment mode (C1: DT ADJUST).

8-2-1. De-distortion Wave Manual Adjustment

Preparations for adjustment

- .Connect the monitor TV to MONITOR Y OUTPUT connector on the connector panel.
- .Confirm the connector CN2 on SR-52 board is connected.
- .Set switches S2-bits1, 2, 4 and 5 on DT-28 board (B-1) to ON.
- .Confirm the unit is in the eject mode.
- .Turn the POWER to ON, and confirm D10 on DT-28 board (A-1) turns OFF after several seconds later.
- .Return switch S2-bit4 on DT-28 board to OFF.
- .Press switch S302 on SS-48DP board.
  Then the unit put into the maintenance mode, and seven kinds of mode display on the monitor screen.
- .Press the search dial to put into jog mode, and move * mark to "C1: DT ADJUST" displaying on the monitor screen with the search dial.
- .Press switch S302 on SS-48DP board.
  By this operation, "DT ADJUST" item is selected.
  "DT ADJUST" menu will display on the monitor screen.
- .Move * mark to "C11 De-distortion waves" with the search dial (in jog mode).
- .Press switch S302 on SS-48DP board, and execute the "De-distortion waves" item.

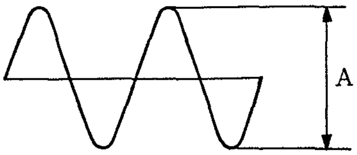
Specifications and adjustment

Step-1

- .Move * mark to "Ach manual adjust" with the search dial.
- .Press switch S1 on DT-28 board (A-1), and execute the de-distortion mode.
- .Observe the waveform at TP204 on DT-28 board (F-1).
- .While pressing the search button, turn the search dial to meet the specification of the level of the waveform.

TP204/DT-28(F-1)

A = 7.9 ± 0.2 Vp-p



TRIG: INT

Specifications and adjustment

Step-2

.Move * mark to "Bch manual adjust" with the search dial.

.Perform the adjustment as the same manner of Step-1.

CH-B: TP208/DT-28(F-1)

A = 7.9 ± 0.2 Vp-p

TRIG: INT

Specifications and adjustment

Step-3

.Move * mark to "C15: Save adjust data" displaying on the monitor screen with the search dial.

.Press switch S302 on SS-48DP board.
By this operation, "Save adjust data" menu is selected.

.Move * mark to "Save all adj. data" with the search dial (in jog mode).

.Press switch S302 on SS-48DP board, and execute the "Save adjust data" menu.

.After about six seconds later, when the save operation is completed, "SAVE COMPLETE" is displayed.

.After confirm the message of "SAVE COMPLETE", press S303 on SS-48DP board three times, then the maintenence mode is finished.

.After saving data, return the switches S2-bits1, 2 and 5 on DT-28 board to OFF.

8-3. RF SWITCHING POSITION ADJUSTMENT (RP HEAD)

- In this adjustment, two kinds of adjustment methods are existed.
  One is auto adjustment, another is manual adjustment.
- Perform the auto adjustment first, and then if the "ADJUST INCOMPLETE" is displayed on the monitor screen, perform the manual adjustment.
- The auto adjustment procedures are deleted in this section, please refer to Section 5-16. RF switching position adjustment (RP head).

8-3-1. RF Switching Position (RP Head) Manual Adjustment

Preparations for adjustment

- Connect the monitor TV to MONITOR Y connector on the connector panel.
- Confirm the connector CN2 on SR-52 board is connected.
- Set the DT SELECT switch on the front panel to OFF.
- Set switches S601-bits1 and 4 on SS-48DP board (B-1) to ON.
- Confirm the unit is in the eject mode.
- Turn the POWER to ON.
- Press switch S302 on SS-48DP board.
  Then the unit put into the maintenance mode, and seven kinds of mode display on the monitor screen.
- Press the search dial to put into jog mode, and move * mark to "B1: SERVO ADJUST" displaying on the monitor screen with the search dial.
- Press switch S302 on SS-48DP board.
  By this operation, "SERVO ADJUST" item is selected.
  "SERVO ADJUST" menu will display on the monitor screen.
- Move * mark to "B110 RF SWITCHING POS." with the search dial (in jog mode).
- Press switch S302 on SS-48DP board, and execute the "RF SWITCHING POS. item.

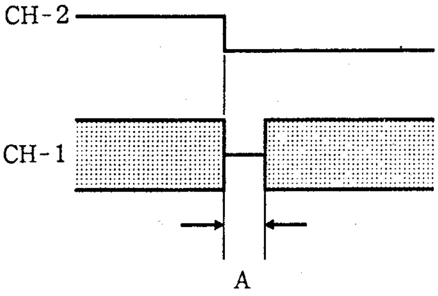
Specifications and adjustment

Step-1

- Move * mark to "MANUAL ADJUST" with the search dial.
- Insert an alignment tape CR2-1B PS into the unit, and press the PLAY button.
- Observe the waveforms at TP803 and TP701 on AFM-8 board (C-1).
- While pressing the search button, turn the search dial to meet the specification of the gap of the waveform.

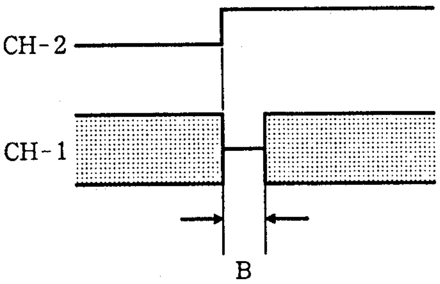
CH-1: TP803/AFM-8 (C-1) (RF waveform)
CH-2: TP701/AFM-8 (C-1) (Switching pulse)
TRIG: TP701/AFM-8 (C-1) (Switching pulse)

When TRIG is + state:



A = less than 20 us

When TRIG is - state:



B = less than 20 us

- After adjustment is completed, press S302 on SS-48DP board.
  "ADJUST END" is displayed on the monitor screen, and the alignment tape is ejected automatically,

Specifications and adjustment

Step-2

- Move * mark to "B117: NOV RAM CONTROL" displaying on the monitor screen with the search dial.
- Press switch S302 on SS-48DP board.
  By this operation, "NOV RAM CONTROL" menu is selected.
- Move * mark to "SAVE ALL ADJ. DATA" with the search dial (in jog mode).
- Press switch S302 on SS-48D board, and execute the "SAVE ALL ADJUST DATA" menu.
- After about six seconds later, when the save operation is completed, "SAVE COMPLETE" is displayed.
- After confirm the message of "SAVE COMPLETE", press S303 on SS-48DP board three times, then the maintenence mode is finished.
- After saving data, return the switches S601-bits1 and 4 on SS-48DP board to OFF (OPEN).

8-4. RF SWITCHING POSITION ADJUSTMENT (DT HEAD)

- .Before perform this adjustment, Section 5-16 or 8-3. RF switching position adjustment (RP head) should be completed.
- .In this adjustment, two kinds of adjustment methods are existed. One is auto adjustment, another is manual adjustment.
- .Perform the auto adjustment first, and then if the "ADJUST INCOMPLETE" is displayed on the monitor screen, perform the manual adjustment.
- .The auto adjustment procedures are deleted in this section, please refer to Section 5-17. RF switching position adjustment (DT head).

8-4-1. RF Switching Position (DT Head) Manual Adjustment

Preparations for adjustment

- .Connect the monitor TV to MONITOR Y connector on the connector panel.
- .Confirm the connector CN2 on SR-52 board is connected.
- .Set the DT SELECT switch on the front panel to VAR.
- .Set switches S2-bits1, 2 and 5 on DT-28 board (B-1) to ON.
- .Confirm the unit is in the eject mode.
- .Turn the POWER to ON.
- .Press switch S302 on SS-48DP board.
  Then the unit put into the maintenance mode, and seven kinds of mode display on the monitor screen.
- .Press the search dial to put into jog mode, and move * mark to "C1: DT ADJUST" displaying on the monitor screen with the search dial.
- .Press switch S302 on SS-48DP board.
  By this operation, "DT ADJUST" item is selected.
  "DT ADJUST" menu will display on the monitor screen.
- .Move * mark to "C12 DT Sw Position" with the search dial (in jog mode).
- .Press switch S302 on SS-48DP board, and execute the "DT Sw Position" item.

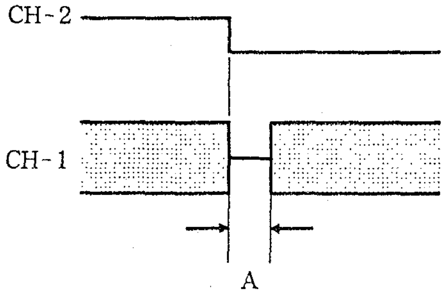
Specifications and adjustment

Step-1

- .Move * mark to "manual adjust" with the search dial.
- .Insert an alignment tape CR2-1B PS into the unit, and press the PLAY button.
- .Observe the waveforms at TP803 and TP701 on AFM-8 board (C-1).
- .While pressing the search button, turn the search dial to meet the specification of the gap of the waveform.
- .Switch the TRIG of an oscilloscope to + and -, and confirm the waveform to meet the specification.

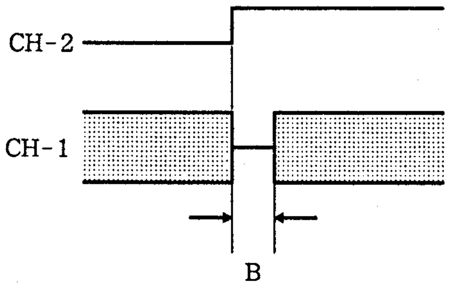
CH-1: TP803/AFM-8 (C-1) (RF waveform)
CH-2: TP701/AFM-8 (C-1) (Switching pulse)
TRIG: TP701/AFM-8 (C-1) (Switching pulse)

When TRIG is + state:



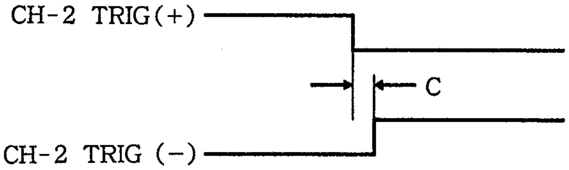
A = less than 20 us

When TRIG is - state:



B = less than 20 us

When TRIG is switched to + and -:



C = less than 5 us

Specifications and adjustment

Step-2

.Move * mark to "C15: Save adjust data" displaying on the monitor screen with the search dial.

.Press switch S302 on SS-48DP board.
By this operation, "Save adjust data" menu is selected.

.Move * mark to "Save all adj. data" with the search dial (in jog mode).

.Press switch S302 on SS-48DP board, and execute the "Save alladjust data" menu.

.After about six seconds later, when the save operation is completed, "SAVE COMPLETE" is displayed.

.After confirm the message of "SAVE COMPLETE", press S303 on SS-48DP board three times, then the maintenence mode is finished.

.After saving data, return the switches S2-bits1, 2 and 5 on DT-28 board to OFF.

8-5. STRAIN GAUGE AND LOOP GAINS ADJUSTMENT

.The maintenance menu items "C13" and "C14" have two kinds of adjustment methods each.
One is auto adjustment, another is manual adjustment.
But, the manual adjustment for "C13 Strain Gauge gains" is only factory use.
Then, in this adjustment procedure describes only "C14 DT drive amplitudes".

.Perform the auto adjustment first, and then if the "ADJUST INCOMPLETE" is displayed on the monitor screen, perform the manual adjustment.

.The auto adjustment procedures are deleted in this section, please refer to Section 2-21-6. DT system adjustment mode (C1: DT ADJUST).

8-5-1. DT Drive Amplitudes Adjustment

Preparations for adjustment

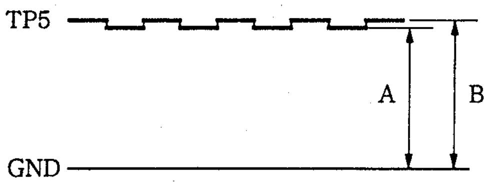
.Connect the monitor TV to MONITOR Y connector on the connector panel.
.Set switches S2-bits1 and 5 on DT-28 board (B-1) to ON.
.Confirm the unit is in the eject mode.
.Turn the POWER to ON.
.Press switch S302 on SS-48DP board.
Then the unit put into the maintenance mode, and seven kinds of mode display on the monitor screen.
.Press the search dial to put into jog mode, and move * mark to "C1: DT ADJUST" displaying on the monitor screen with the search dial.
.Press switch S302 on SS-48DP board.
By this operation, "DT ADJUST" item is selected.
"DT ADJUST" menu will display on the monitor screen.
.Move * mark to "C14 DT drive amplitudes" with the search dial (in jog mode).
.Press switch S302 on SS-48DP board, and execute the "DT drive amplitudes" item.

Specifications and adjustment

Step-1

.Move * mark to "Ach manual adjust" with the search dial.
.Press switch S302 on SS-48DP board, and execute the "Ach manual adjust" item.
.Insert an alignment tape CR5-1B PS of the color-bar signal portion (14:00 to 17:00).
.Play back the alignment tape in the variable mode.
.Observe the waveform at TP5 on DT-28 board.
.While pressing the search button, turn the search dial to meet the specification of the level of the waveform in both variable x3 mode and x-1 mode.

TP5/DT-28
Waveform of the oscilloscope



A = 2.5 ± 0.5 Vdc
B = 2.5 ± 0.5 Vdc

TRIG: TP105/DT-28

Specifications and adjustment

Step-2

.Move * mark to "Bch manual adjust" with the search dial.
.Perform the adjustment as the same manner of Step-1.

.After adjustments are completed, eject the alignment tape from the unit.
.Press switch S303 on SS-48DP board to return the menu screen.

Specifications and adjustment

Step-3

.Move * mark to "C15: Save adjust data" displaying on the monitor screen with the search dial.
.Press switch S302 on SS-48DP board.
By this operation, "Save adjust data" menu is selected.
.Move * mark to "Save all adj. data" with the search dial (in jog mode).
.Press switch S302 on SS-48DP board, and execute the "Save adjust data" menu.
.After about six seconds later, when the save operation is completed, "SAVE COMPLETE" is displayed.
.After confirm the message of "SAVE COMPLETE", press S303 on SS-48DP board three times, then the maintenence mode is finished.
.After saving data, return the switches S2-bits1 and 5 on DT-28 board to OFF.

SECTION 9

AUDIO/TIME CODE ALIGNMENT

(Equipment Required)

.Oscilloscope	(TEKTRONIX 2445 or equivalent)
.Audio Signal Genrator	(HP 8904 or equivalent)
.Audio Distortion Analyzer	(HP 339A or equivalent)
.Frequency Counter	
.Audio Level Meter	
.Blank Tape (oxide) BCT-20G	
.Blank Tape (metal) BCT-20M	

NOTE: "Blank Tape" indicates a cassette tape on which no video/audio signals are recorded. (An CTL signal is only recorded.)

"How to make a blank tape"

1) Set TC EXT/INT switch on the subcontrol panel to EXT.
2) Set REC INHIBIT switch on the subcontrol panel to OFF.
3) Set AUDIO INPUT LEVEL CH-1 and CH-2 switches on the connector panel to HIGH, and AUDIO INPUT 600-ohm termination switch (CH-1 and CH-2) to ON.
4) Pull the REC level controls (CH-1 to CH-4), and turn fully clockwise (make minimum).
5) Insert a cassette tape (BCT-20M (METAL) or BCT-20G (OXIDE)).
6) Put the unit into REC mode from tape beginning to end. (The CTL signal is only recorded.)

.Alignment Tape CR8-1A PS (part No. 8-960-098-45)

Contents

TIME (min s)	AUDIO TRACK
0:00 to 2:55	1 kHz, 0VU (*1)
2:55 to 3:00	Blank
3:00 to 4:55	10 kHz, -10VU
4:55 to 5:00	Blank
5:00 to 5:55	1 kHz, -20VU
5:55 to 6:00	Blank
6:00 to 7:55	40 Hz, 7 kHz, 10 kHz, 15 kHz, -20VU (*2)
7:55 to 8:00	Blank
8:00 to 10:00	1 kHz, 0VU CTL TRACK: 1 kHz, 0VU

.Alignment Tape CR8-1B PS (part No. 8-960-096-86)
Contents

TIME (min s)	AUDIO TRACK	VIDEO TRACK	CTL TRACK
0:00 to 2:30	1 kHz, 0VU (*1)	Black Burst	CTL
2:30 to 5:00	Blank(only bias) 15 kHz, 0VU	Black Burst Black Burst	CTL CTL
5:00 to 6:00	1 kHz, -20VU	Black Burst	CTL
6:00 to 6:30	40 Hz -20 VU (*2)	Black Burst	CTL
6:30 to 7:00	7 kHz, -20VU (*2)	Black Burst	CTL
7:00 to 7:30	10 kHz, -20VU (*2)	Black Burst	CTL
7:30 to 8:00	15 kHz, -20VU (*2)	Black Burst	CTL
8:00 to 10:00	1 kHz, 0VU	----	1 kHz sine wave

*1. When this tape is reproduced in the audio reference level check or adjustment, the output level (0 dB) should be corrected according to the correction value as follows.
Example: Correction value = - 0.5 dB
Output level = 0 dB - 0.5 dB = -0.5 dB

*2. When this tape is reproduced in the audio frequency response check or adjustment, the output level should be corrected according to the correction value.

(Switch Setting)

Following setting should not be changed in position unless otherwise specified.

- <Upper Control Panel>
  - REMOTE/LOCAL: LOCAL
  - AUDIO INPUT SELECT: ANALOG
  - AUDIO MIXING: OFF
  - AUDIO MONITOR (CH-1/3, ST, CH-2/4): ST
  - AUDIO MONITOR (LNG, AFM): LNG
  - REC level control (CH-1 to CH-4): PRESET (push)
  - PB level control (CH-1 to CH-4): PRESET (push)
  - HEADPHONES: MAX (turn to fully clockwise)
- <Lower Control Panel>
  - DT SELECT: OFF
  - CTL/TC/U-BIT: CTL
  - PB/PB/EE: PB/EE
  - CONFI: ON
- <Sub Control Panel>
  - TC EXT/INT: INT
  - REC INHIBIT: OFF
  - DIGITAL AUDIO INPUT: AES/EBU
  - DIGITAL AUDIO EMPHASIS: OFF
  - AFM INPUT: CH-3/4
  - DOLBY NR: OFF
- <System Control Panel>
  - VITC/AUTO/LTC: AUTO
  - VITC: ON
  - TC GENERATOR
    - REGEN/PRESET: PRESET
    - REC RUM/FREE RUN: FREE RUN
  - AUDIO LIMITER: OFF
  - VTR CONTROL: INT
- <Connector panel>
  - AUDIO INPUT LEVEL (CH-1 to CH-4): HIGH
  - AUDIO INPUT 600-ohm (CH-1 to CH-4): ON
- <AU-146P Board Switch Setting>
  - S901 (C-1): OFF
- <AFM-8 Board Switch Setting>
  - S1 (G-1): All OFF
- <RP-53P Board Switch Setting>
  - S351 Bit-1: ON
  - S351 Bit-2: OFF
  - S351 Bit-3: ON
  - S351 Bit-4: OFF
  - S451 Bit-1: ON
  - S451 Bit-2: OFF
  - S451 Bit-3: ON
  - S451 Bit-4: OFF
  - S501 Bit-1: ON
  - S501 Bit-2: OFF
  - S501 Bit-3: ON
  - S501 Bit-4: OFF
  - S601 Bit-1: ON
  - S601 Bit-2: OFF
  - S601 Bit-3: ON
  - S601 Bit-4: ON

9-1. DOLBY POINT (EE) ADJUSTMENT

Preparations for adjustment

- . Supply a 1.0 kHz +4.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
- . EE mode

Specifications and adjustment

CH-1: TP103/AU-147P (G-3)
CH-2: TP203/AU-147P (E-3)

-10.0 ± 0.1 dBu

Adjustment: CH-1: RV102/AU-147P (G-4)
CH-2: RV202/AU-147P (F-4)

9-2. EE LEVEL ADJUSTMENT

Preparations for adjustment for Step-1 and Step-2

- . Supply a 1.0 kHz +4.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
- . EE mode

Specifications and adjustment

Step-1
CH-1: TP151/AU-146P (E-5)
CH-2: TP251/AU-146P (C-5)

-1.0 ± 0.1 dBu

Adjustment: CH-1: RV151/AU-146P (D-4)
CH-2: RV251/AU-146P (C-4)

Specifications and adjustment

Step-2
ANALOG AUDIO OUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUT CH-2 (terminated with 600-ohm)

+4.0 ± 0.1 dBm

Adjustment: CH-1: RV101/AU-145 (G-1)
CH-2: RV201/AU-145 (F-1)

Preparations for adjustment for Step-3

- .Set AUDIO INPUT LEVEL CH-1 and CH-2 switches on the connector panel to LOW.
- .Supply a 1.0 kHz -60.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
- .EE mode

Specifications and adjustment

Step-3

ANALOG AUDIO OUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUT CH-2 (terminated with 600-ohm)

+4.0 ± 1.0 dBm

Adjustment: Confirmation

Preparations for adjustment for Step-4

- .Supply no signal input to ANALOG AUDIO INPUT CH-1 to CH-4 connectors.

Specifications and adjustment

Step-4

ANALOG AUDIO OUT CH-1 to CH-4 (terminated with 600-ohm)

less than -45.0 dBm

Adjustment: Confirmation

NOTE: After confirmation is completed, reset AUDIO INPUT LEVEL CH-1 to CH-4 switches to HIGH.

Preparations for adjustment for Step-5

- .Confirm the AUDIO INPUT LEVEL CH-1 to CH-4 switches are to HIGH.
- .Supply no signal input to ANALOG AUDIO INPUT CH-1 to CH-4 connectors.

Specifications and adjustment

Step-5

ANALOG AUDIO OUT CH-1 to CH-4 (terminated with 600-ohm)

less than -60.0 dBm

Adjustment: Confirmation

9-3. AFM EE LEVEL ADJUSTMENT

Preparations for adjustment for Step-1 and Step-2

- .Supply a 400 Hz +4.0 dBu signal to ANALOG AUDIO INPUT CH-3 and CH-4 connectors.
- .EE mode

Specifications and adjustment

Step-1

CH-1: TP302/AFM-8 (F-7)
CH-2: TP502/AFM-8 (G-7)

-1.0 ± 0.1 dBu

Adjustment: CH-1: RV301/AFM-8 (F-6)
CH-2: RV501/AFM-8 (G-6)

Specifications and adjustment

Step-2

ANALOG AUDIO OUT CH-3 (terminated with 600-ohm)
ANALOG AUDIO OUT CH-4 (terminated with 600-ohm)

+4.0 ± 0.1 dBm

Adjustment: CH-1: RV301/AU-145 (E-1)
CH-2: RV401/AU-145 (C-1)

Preparations for adjustment for Step-3

- .Supply a 400 Hz -60.0 dBu signal to ANALOG AUDIO INPUT CH-3 and CH-4 connectors.
- .Set AUDIO INPUT LEVEL CH-3 and CH-4 switches to LOW.
- .EE mode

Specifications and adjustment

Step-3

ANALOG AUDIO OUT CH-3 (terminated with 600-ohm)
ANALOG AUDIO OUT CH-4 (terminated with 600-ohm)

+4.0 ± 1.0 dBm

Adjustment: Confirmation

NOTE: After confirmation is completed, reset AUDIO INPUT LEVEL CH-3 and CH-4 switches to HIGH.

9-4. SELECTED OUTPUT LEVEL ADJUSTMENT

Preparations for adjustment

- .Supply a 1.0 kHz +4.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
- .Disconnect COR901 on AU-146P board (A-1).
- .Confirm the AUDIO MONITOR switch on the control panel is LNG position.
- .EE mode

Specifications and adjustment

ANALOG SELECTED OUT CH-1/CH-3
ANALOG SELECTED OUT CH-2/CH-4

+4.0 ± 0.1 dBu

Adjustment: CH-1: RV501/AU-145 (B-1)
CH-2: RV601/AU-145 (A-1)

NOTE: After adjustment is completed, connect COR901.

9-5. HEADPHONES OUTPUT LEVEL CHECK

Preparations for adjustment for Step-1

- .Connect a stereo phone Jack between the HEADPHONES jack and an audio level meter (terminated by 8 ohms).
- .Set the AUDIO MONITOR switch on the control panel to ST.
- .Supply a 1.0 kHz +4.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
- .Turn the HEADPHONES volume level control fully clockwise.
- .EE mode

Specifications and adjustment

Step-1
HEADPHONES connector OUT (CH-1/CH-2)

-12.0 ± 1.2 dBu

Adjustment: Confirmation

Preparations for adjustment for Step-2

- Turn the HEADPHONES volume level control fully counterclockwise.

Specifications and adjustment

Step-2

HEADPHONES connector OUT (CH-1/CH-2)

less than -70 dBu

Adjustment: Confirmation

NOTE: After confirmations are completed, remove a HEADPHONES plug.

9-6. LIMITER LEVEL ADJUSTMENT

Preparations for adjustment for Step-1

- Set AUDIO INPUT LEVEL CH-1 and CH-2 switches on the connector panel to LOW.
- Supply a 1.0 kHz -30.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
- Set AUDIO LIMITER switch on SWC-12P board to ON.
- EE mode

Specifications and adjustment

Step-1

ANALOG AUDIO OUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUT CH-2 (terminated with 600-ohm)

+15.0 ± 0.5 dBm

Adjustment: RV901/AU-147P (G-6)

Preparations for adjustment for Step-2

- .Supply a 1.0 kHz -60.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
- .Set AUDIO LIMITER switch on SWC-12P board to OFF.
- .EE mode

Specifications and adjustment

Step-2
ANALOG AUDIO OUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUT CH-2 (terminated with 600-ohm)

+4.0 ± 1.0 dBm
(Confirm the level, and this level called "A".)

Adjustment: Confirmation

Preparations for adjustment for Step-3

- .Set AUDIO LIMITER switch on SWC-12P board to ON.
- .EE mode

Specifications and adjustment

Step-3
ANALOG AUDIO OUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUT CH-2 (terminated with 600-ohm)

"A" ± 0.2 dBm

Adjustment: Confirmation

NOTE: After adjustments are completed, reset AUDIO LIMITER switch to OFF, and AUDIO INPUT LEVEL CH-1 and CH-2 switches to HIGH.

9-7. AUDIO METER ADJUSTMENT/CHECK

Preparations for adjustment for Step-1

- .Set AFM INPUT switch on the subcontrol panel to CH-1/2.
- .Set SCALE SWITCH located on the upper left of the AUDIO METER to VU.
- .Supply a 1.0 kHz +4.2 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.

Specifications and adjustment

Step-1

The segment which is upper by one step than the display indicator's 0 VU should blink

Adjustment: CH-1: RV11/DP-126 (E-1)
CH-2: RV21/DP-126 (D-1)
CH-3: RV31/DP-126 (C-1)
CH-4: RV41/DP-126 (B-1)

Preparations for adjustment for Step-2

- .Supply a 1.0 kHz +4.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.

Specifications and adjustment

Step-2

Up to the display indicator's 0 VU lights, and the segment which is upper by one step should go off.

Adjustment: Confirmation

Preparations for adjustment for Step-3

- .Set SCALE SWITCH located on the upper left of the AUDIO METER to dB.
- .Supply a 1.0 kHz +13.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.

Specifications and adjustment

Step-3

The segment of the display indicator's 0 dB ± 1 segment should light.

Adjustment: CH-1: RV12/DP-126 (E-1)
CH-2: RV22/DP-126 (D-1)
CH-3: RV32/DP-126 (C-1)
CH-4: RV42/DP-126 (B-1)

Preparations for adjustment for Step-4

.Supply a 1.0 kHz -17.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.

Specifications and adjustment

Step-4

The segment of the display indicator's -30 dB ± 1 segment should light.

Adjustment: Confirmation

Preparations for adjustment for Step-5

.Supply a 1.0 kHz -27.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.

Specifications and adjustment

Step-5

The segment of the display indicator's -40 dB ± 1 segment should light.

Adjustment: Confirmation

NOTE: After confirmations are completed, reset the SCALE SWITCH to VU.

Preparations for adjustment for Step-6

.Pull the REC level controls of CH-1 tO CH-4, and turn fully clockwise.
.Supply a 1.0 kHz +12.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
.EE mode

Specifications and adjustment

Step-6

"OVER" displays for CH-1 to CH-4 should light.

Adjustment: Confirmation

9-10. R/P HEAD PB PHASE ADJUSTMENT

. Before performing this adjustment, Audio Head Phase Adjustment in Section 5-9 should be completed.

Preparations for adjustment

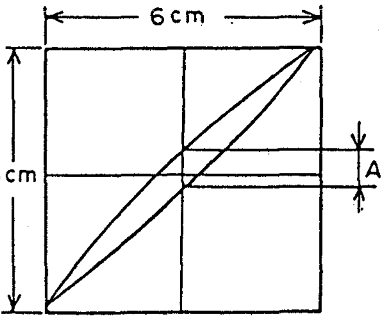
. Play back an audio 15 kHz 0 VU signal portion of an alignment tape CR8-1A PS.

Specifications and adjustment

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)
Lissajous waveform of the oscilloscope (X-Y mode)

A : less than 0.52 cm (within± 5 degrees)

Adjustments: RV121/AU-146P (G-4)
RV221/AU-146P (F-4)



9-11. CONFI HEAD PB LEVEL ADJUSTMENT

Preparations for adjustment

. Set switch S901 on AU-146P board (C-1) to ON.
. Play back an audio 1 kHz 0 VU signal portion (0:00 to 2:30) of an alignment tape CR8-1A PS.

Specifications and adjustment

Step-1
CH-1: TP351/AU-146P (G-2)
CH-2: TP451/AU-146P (G-1)

-10.0 ± 0.1 dBu

Adjustments: CH-1: RV351/AU-146P (G-3)
CH-2: RV451/AU-146P (E-3)

Specifications and adjustment

Step-2
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

+4.0 ± 0.1 dBm

Adjustments: CH-1: RV352/AU-146P (F-1)
CH-2: RV452/AU-146P (E-1)

NOTE: After adjustment is completed, reset switch S901 to OFF.

9-12. R/P HEAD PB LEVEL ADJUSTMENT

Preparations for adjustment for Step-1 and Step-2

.Play back an audio 1 kHz 0 VU signal portion (0:00 to 2:30) of an alignment tape CR8-1A PS.

Specifications and adjustment

Step-1
CH-1: TP103/AU-147P (G-3)
CH-2: TP203/AU-147P (E-3)

-10.0 ± 0.1 dBu

Adjustments: CH-1: RV101/AU-147P (G-4)
CH-2: RV201/AU-147P (E-4)

Specifications and adjustment

Step-2
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

+4.0 ± 0.1 dBm

Adjustments: CH-1: RV181/AU-146P (D-4)
CH-2: RV281/AU-146P (C-4)

Preparations for adjustment for Step-3

.Put the unit into REW mode at audio 1 kHz (0 VU) signal portion (0:00 to 2:30) of the alignment tape CR8-1A PS.

Specifications and adjustment

Step-3
CH-1: TP103/AU-147P (G-3)
CH-2: TP203/AU-147P (E-3)

less than -4.0 dBm

Adjustments: CH-1: Confirmation
CH-2: Confirmation

9-13. ERASE HEAD TUNING ADJUSTMENT

Preparations for adjustment

- .Set switch S601 bit-4 on SS-48DP board (B-1) to ON.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.
- .No signal input.

Specifications and adjustment

Step-1

TP631/AU-147P (C-5)

Maximize the level
(Should be more than 130 mVrms.)
(No waveform distortion should appear.)

Adjustment: LV631/AU-147P (B-5)

Specifications and adjustment

Step-2

TP651/AU-147P (B-5)

Maximize the level
(Should be more than 130 mVrms.)
(No waveform distortion should appear.)

Adjustment: LV651/AU-147P (B-5)

Specifications and adjustment

Step-3

TP671/AU-147P (A-5)

Maximize the level
(Should be more than 110 mVrms.)
(No waveform distortion should appear.)

Adjustment: LV671/AU-147P (A-5)

NOTE: After adjustment is completed, reset S601 bit-4 to OFF.

9-14. R/P HEAD TUNING ADJUSTMENT

Preparations for adjustment

- .Set switch S601 bit-4 on SS-48DP board (B-1) to ON.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.
- .No signal input.

Specifications and adjustment

CH-1:TP312/RP-53P (F-2)
CH-2:TP412/RP-53P (E-2)

Maximize the level
(No waveform distortion should appear.)

Adjustments: CH-1: T301/RP-53P (G-2)
CH-2: T401/RP-53P (D-2)

NOTE: After adjustment is completed, reset S601 bit-4 to OFF.

9-15. BIAS TRAP ADJUSTMENT

Preparations for adjustment for Step-1 and Step-2

- .Set switch S601 bit-4 on SS-48DP board (B-1) to ON.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.
- .No signal input.

Specifications and adjustment

Step-1
CH-1: TP311/RP-53P (F-2)
CH-2: TP411/RP-53P (E-2)

Minimize the level
(Should be less than +14.0 dBu.)

Adjustments: CH-1: LV311/RP-53P (F-1)
CH-2: LV411/RP-53P (E-1)

Specifications and adjustment

Step-2

CH-1: TP501/RP-53P (G-5)
CH-2: TP601/RP-53P (D-5)

Minimize the level
(Should be less than -10.0 dBu.)

Adjustments: CH-1: LV501/RP-53P (G-4)
CH-2: LV601/RP-53P (D-4)

Preparations for adjustment for Step-3

- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into CH-1 INSERT mode (press CH-1 INSERT, PLAY and EDIT buttons).
- .Turn AUDIO CH-2 INSERT button to OFF.
- .No signal input.

Specifications and adjustment

Step-3

TP451/RP-53P (D-4)

Minimize the level
(Should be less than -3.0 dBu.)

Adjustment: LV452/RP-53P (D-3)

Preparations for adjustment for Step-4

- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into CH-2 INSERT mode (press CH-2 INSERT, PLAY and EDIT buttons).
- .Turn AUDIO CH-1 INSERT button to OFF.
- .No signal input.

Specifications and adjustment

Step-4

TP351/RP-53P (F-4)

Minimize the level
(Should be less than -3.0 dBu.)

Adjustment: LV352/RP-53P (G-3)

NOTE: After adjustments are completed, reset S601 bit-4 to OFF.

9-16. BIAS CURRENT ADJUSTMENT

Preparations for adjustment for Step-1

- .Set switch S601 bit-4 on SS-48DP board (B-1) to ON.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode.
- .No signal input.

Specifications and adjustment

Step-1

CH-1: TP312/RP-53P (F-2)
CH-2: TP412/RP-53P (E-2)

8.0 ± 0.3 mVrms

Adjustments: CH-1: RV602/AU-147P (C-1)
CH-2: RV702/AU-147P (C-1)

Preparations for adjustment for Step-2

- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.
- .No signal input.

Specifications and adjustment

Step-2

CH-1: TP312/RP-53P (F-2)
CH-2: TP412/RP-53P (E-2)

16.0 ± 0.3 mVrms

Adjustments: CH-1: RV601/AU-147P (C-1)
CH-2: RV701/AU-147P (C-1)

NOTE: After adjustments are completed, reset S601 bit-4 to OFF.

9-17. OVERALL LEVEL TENTATIVE ADJUSTMENT

Preparations for adjustment for Step-1

.Supply a 1.0 kHz +4.0 dBs signal to ANALOG AUDIO CH-1 and CH-2 connectors.
.Insert a blank tape BCT-20G (OXIDE).
.Put the unit into REC mode.

Specifications and adjustment

Step-1
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

+4.0 ± 0.2 dBm

Adjustments: CH-1: RV106/AU-147P (G-2)
CH-2: RV206/AU-147P (F-2)

Preparations for adjustment for Step-2

.Insert a blank tape BCT-20G (OXIDE).
.Put the unit into REC mode about 10 seconds.
.Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-2
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

+4.0 ± 0.5 dBm

If the specification is not satisfied, fine adjust RV106 and RV206 again according to Step-1 again.

Preparations for adjustment for Step-3

.Insert a blank tape BCT-20M (METAL).
.Put the unit into REC mode.

Specifications and adjustment

Step-3
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

+4.0 ± 0.2 dBm

Adjustments: CH-1: RV103/AU-147P (G-2)
CH-2: RV203/AU-147P (F-2)

Preparations for adjustment for Step-4

- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode about 10 seconds.
- .Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-4

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

+4.0 ± 0.5 dBm

If the specification is not satisfied, fine adjust RV103 and RV203 again according to Step-3 again.

9-18. OVERALL FREQUENCY RESPONSE ADJUSTMENT (OXIDE)

Preparations for adjustment

- .Supply 1 kHz, 3 kHz, 7 kHz, 10 kHz and 15 kHz -16.0 dBu signals to ANALOG AUDIO CH-1 and CH-2 connectors.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode about 10 seconds respectively for each signal.

Specifications and adjustment

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
3 kHz : 0 ± 0.3 dB
7 kHz : 0 ± 0.3 dB
10 kHz: 0 ± 0.3 dB
15 kHz: -0.3 +0.3/-0.6 dB

Adjustments: CH-1: RV107/AU-147P (G-2)
RV110/AU-147P (G-1)
CH-2: RV207/AU-147P (F-2)
RV210/AU-147P (F-1)

If the specification is not satisfied using above controls, fine adjust RV602 (CH-1) and RV702 (CH-2) on AU-147 board.

9-19. OVERALL PHASE ADJUSTMENT (OXIDE)

Preparations for adjustment for Step-1

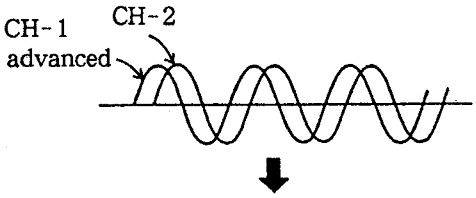
- .Supply a 15.0 kHz +4.0 dBu signal to ANALOG AUDIO CH-1 and CH-2 connectors.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode.

Specifications and adjustment

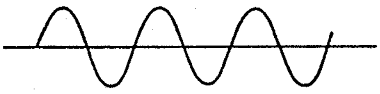
Step-1

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

Adjust the advanced channel so that the both phases are aligned.



Align the phase of CH-1 with that of CH-2.



Adjustments: CH-1: RV108/AU-147P (G-1)
CH-2: RV208/AU-147P (F-1)

Preparations for adjustment for Step-2

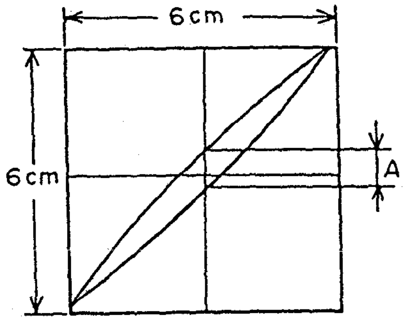
.After adjustment, record a 15.0 kHz +4.0 dBu signal, and play back the self-recorded portion of the tape.

.Display the lissajous's waveform.

Specifications and adjustment

Step-2

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)



A : less than 0.52 cm
(within ± 5 degrees)
Repeat Step-1 and Step-2 until the specification of Step-2 is satisfied.

9-20. OVERALL LEVEL ADJUSTMENT (OXIDE)

Preparations for adjustment for Step-1

.Supply a 1.0 kHz +4.0 dBu signal to ANALOG AUDIO CH-1 and CH-2 connectors.

.Insert a blank tape BCT-20G (OXIDE).

.Put the unit into REC mode.

.Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-1

CH-1: TP103/AU-147P (G-3)
CH-2: TP203/AU-147P (E-3)

-10.0 ± 0.2 dBu

If the specification is not satisfied, memorize the difference level from -10.0 dBu.

Adjustments: CH-1: Confirmation
CH-2: Confirmation

Preparations for adjustment for Step-2

.Set the CONFI switch on the control panel to ON.
.Put the unit into REC mode again.

Specifications and adjustment

Step-2

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

Correct the value memorized in Step-1.

When the level is higher than the specified value in Step-1, lower the level proportionally. When it is lower than the specified value, raise the level proportionally.

Adjustments: CH-1: RV106/AU-147P (G-2)
CH-2: RV206/AU-147P (F-2)

Preparations for adjustment for Step-3

.After adjustment is completed, put the unit into REC mode again.
.Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-3

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

+4.0 ± 0.4 dBm

If the specification is not satisfied, repeat Step-1 and Step-2.

Adjustments: CH-1: Confirmation
CH-2: Confirmation

9-21. OVERALL FREQUENCY RESPONSE ADJUSTMENT (METAL)

Preparations for adjustment

- .Supply 1 kHz, 3 kHz, 7 kHz, 10 kHz and 15 kHz -16.0 dBu signals to ANALOG AUDIO CH-1 and CH-2 connectors.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode about 10 seconds respectively for each signal.

Specifications and adjustment

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
3 kHz : 0 ± 0.3 dB
7 kHz : 0 ± 0.3 dB
10 kHz: 0 ± 0.3 dB
15 kHz: 0 ± 0.5 dB

Adjustments: CH-1: RV104/AU-147P (G-2)
RV109/AU-147P (F-1)
CH-2: RV204/AU-147P (E-2)
RV209/AU-147P (E-2)

If the specification is not satisfied using above controls, fine adjust RV601 (CH-1) and RV701 (CH-2) on AU-147P board.

9-22. OVERALL PHASE ADJUSTMENT (METAL)

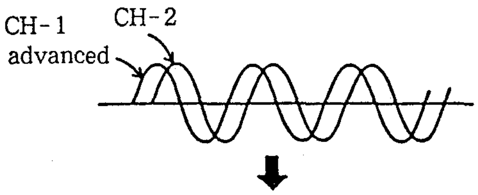
Preparations for adjustment for Step-1

- .Supply a 15.0 kHz +4.0 dBu signal to ANALOG AUDIO CH-1 and CH-2 connectors.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.

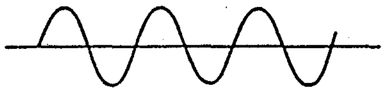
Specifications and adjustment

Step-1
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

Adjust the advanced channel so that the both phases are aligned.



Align the phase of CH-1 with that of CH-2.



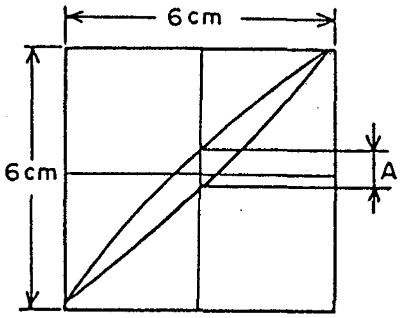
Adjustments: CH-1: RV105/AU-147P (G-1)
CH-2: RV205/AU-147P (F-1)

Preparations for adjustment for Step-2

- .After adjustment, record a 15.0 kHz +4.0 dBu signal, and play back the self-recorded portion of the tape.
- .Display the lissajous's waveform.

Specifications and adjustment

Step-2
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)



A : less than 0.52 cm
(within ± 5 degrees)
Repeat Step-1 and Step-2 until the specification of Step-2 is satisfied.

9-23. OVERALL LEVEL ADJUSTMENT (METAL)

Preparations for adjustment for Step-1

- .Supply a 1.0 kHz +4.0 dBu signal to ANALOG AUDIO CH-1 and CH-2 connectors.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.
- .Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-1
CH-1: TP103/AU-147P (G-3)
CH-2: TP203/AU-147P (E-3)

-10.0 ± 0.2 dBu

If the specification is not satisfied, memorize the difference level from -10.0 dBu.

Adjustments: CH-1: Confirmation
CH-2: Confirmation

Preparations for adjustment for Step-2

- .Set the CONFI switch on the control panel to ON.
- .Put the unit into REC mode again.

Specifications and adjustment

Step-2
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

Correct the value memorized in Step-1.

When the level is higher than the specified value in Step-1, lower the level proportionally. When it is lower than the specified value, raise the level proportionally.

Adjustments: CH-1: RV103/AU-147P (G-2)
CH-2: RV203/AU-147P (F-2)

Preparations for adjustment for Step-3

- After adjustment is completed, put the unit into REC mode again.
- Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-3

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

+4.0 ± 0.4 dBm

If the specification is not satisfied, repeat Step-1 and Step-2.

Adjustments: CH-1: Confirmation
CH-2: Confirmation

9-24. CONFI HEAD FREQUENCY RESPONSE ADJUSTMENT

Preparations for adjustment

- .Supply 1 kHz, 40 Hz, 90 Hz, 3 kHz, 7 kHz, 10 kHz and 15 kHz -16.0 dBu signals to ANALOG AUDIO CH-1 and CH-2 connectors.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode about 5 seconds respectively for each signal.
- .Confirm the CONFI switch on the control panel set to ON.

Specifications and adjustment

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
40 Hz : 0 ± 2.7 dB
90 Hz : 0 ± 2.7 dB
3 kHz : 0 ± 0.5 dB
7 kHz : 0 ± 0.5 dB
10 kHz: 0 ± 0.5 dB
15 kHz: -0.3 +0.5/-1.0 dB

Adjustments: CH-1: RV501/RP-53P (G-4)
RV502/RP-53P (F-5)
CH-2: RV601/RP-53P (D-4)
RV602/RP-53P (E-5)

If the specification at high-frequency range is not satisfied by this adjustment, change the setting of the following switches (bit-1 to bit-4).

CH-1: S501/RP-53P (F-5)
CH-2: S601/RP-53P (E-4)

NOTE: Setting of S501 and S601 on RP-53 board should be the same position.
After setting of these switches, perform this adjustment again.

9-25. CONFI LEVEL ADJUSTMENT

Preparations for adjustment

- .Supply a 1.0 kHz +4.0 dBu signal to ANALOG AUDIO CH-1 and CH-2 connectors.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.
- .Confirm the CONFI switch on the control panel set to ON.

Specifications and adjustment

Step-1
CH-1: TP351/AU-146P (G-2)
CH-2: TP451/AU-146P (G-1)

-10.0 ± 0.2 dBu

Adjustments: CH-1: RV351/AU-146P (G-3)
CH-2: RV451/AU-146P (E-3)

Specifications and adjustment

Step-2
CH-1: TP151/AU-146P (E-5)
CH-2: TP251/AU-146P (C-5)

-1.0 ± 0.2 dBu

Adjustments: CH-1: RV352/AU-146P (F-1)
CH-2: RV452/AU-146P (E-1)

9-26. AUDIO FREQUENCY RESPONSE CHECK (METAL DOLBY OFF)

Preparations for adjustment for Step-1

.Confirm the DOLBY NR switch on the subcontrol panel set to OFF.

.Supply 1 kHz, 40 Hz, 90 Hz, 3 kHz, 7 kHz, 10 kHz and 15 kHz -16.0 dBu signals to ANALOG AUDIO CH-1 and CH-2 connectors.

.Insert a blank tape BCT-20M (METAL).

.Put the unit into REC mode about 5 seconds respectively for each signal.

Specifications and adjustment

Step-1

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
40 Hz : 0 ± 2.5 dB
90 Hz : 0 ± 2.5 dB
3 kHz : 0 ± 0.5 dB
7 kHz : 0 ± 0.5 dB
10 kHz: 0 ± 0.5 dB
15 kHz: 0 ± 1.0 dB

Adjustments: CH-1: Confirmation
CH-2: Confirmation

Preparations for adjustment for Step-2

.Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-2

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
40 Hz : 0 +0.5/-1.5 dB
90 Hz : 0 +0.5/-1.0 dB
3 kHz : 0 ± 0.3 dB
7 kHz : 0 ± 0.3 dB
10 kHz: 0 ± 0.3 dB
15 kHz: 0 ± 0.5 dB

If the specification is not satisfied, perform Overall Frequency Response Adjustment (Metal) in Section 9-21 and Overall Phase Adjustment (Metal) in Section 9-22.

Adjustments: CH-1: Confirmation
CH-2: Confirmation

9-27. AUDIO FREQUENCY RESPONSE CHECK (METAL DOLBY ON)

Preparations for adjustment for Step-1

.Set the DOLBY NR switch on the subcontrol panel set to ON.
.Supply 1 kHz, 40 Hz, 90 Hz, 3 kHz, 7 kHz, 10 kHz and 15 kHz -16.0 dBu signals to ANALOG AUDIO CH-1 and CH-2 connectors.
.Insert a blank tape BCT-20M (METAL).
.Put the unit into REC mode about 5 seconds respectively for each signal.

Specifications and adjustment

Step-1
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
40 Hz : 0 ± 2.7 dB
90 Hz : 0 ± 2.7 dB
3 kHz : 0 ± 2.5 dB
7 kHz : 0 ± 2.5 dB
10 kHz: 0 ± 2.5 dB
15 kHz: 0 ± 2.5 dB

Adjustments: CH-1: Confirmation
CH-2: Confirmation

Preparations for adjustment for Step-2

.Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-2
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
40 Hz : 0 +0.9/-1.8 dB
90 Hz : 0 +0.9/-1.8 dB
3 kHz : 0 ± 0.7 dB
7 kHz : 0 ± 0.7 dB
10 kHz: 0 ± 0.7 dB
15 kHz: 0 +0.9/-1.5 dB

If the specification is not satisfied, perform Overall Frequency Response Adjustment (Metal) in Section 9-21 and Overall Phase Adjustment (Metal) in Section 9-22.

Adjustments: CH-1: Confirmation
CH-2: Confirmation

NOTE: After adjustment is completed, reset the DOLBY NR switch to OFF.

9-28. AUDIO FREQUENCY RESPONSE CHECK (OXIDE DOLBY OFF)

Preparations for adjustment for Step-1

.Confirm the DOLBY NR switch on the subcontrol panel set to OFF.
.Supply 1 kHz, 40 Hz, 90 Hz, 3 kHz, 7 kHz, 10 kHz and 15 kHz -16.0 dBu signals to ANALOG AUDIO CH-1 and CH-2 connectors.
.Insert a blank tape BCT-20G (OXIDE).
.Put the unit into REC mode about 5 seconds respectively for each signal.

Specifications and adjustment

Step-1
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
40 Hz : 0 ± 2.7 dB
90 Hz : 0 ± 2.7 dB
3 kHz : 0 ± 0.5 dB
7 kHz : 0 ± 0.5 dB
10 kHz: 0 ± 0.5 dB
15 kHz: -0.3 +/- 1.0 dB

Adjustments: CH-1: Confirmation
CH-2: Confirmation

Preparations for adjustment for Step-2

.Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-2
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
40 Hz : 0 ± 1.2 dB
90 Hz : 0 ± 1.2 dB
3 kHz : 0 ± 0.3 dB
7 kHz : 0 ± 0.3 dB
10 kHz: 0 ± 0.3 dB
15 kHz: -0.3 +0.3/-0.6 dB

If the specification is not satisfied, perform Overall Frequency Response Adjustment (Oxide) in Section 9-18 and Overall Phase Adjustment (Oxide) in Section 9-19.

Adjustments: CH-1: Confirmation
CH-2: Confirmation

9-29. AUDIO FREQUENCY RESPONSE CHECK (OXIDE DOLBY ON)

Preparations for adjustment for Step-1

.Set the DOLBY NR switch on the subcontrol panel set to ON.
.Supply 1 kHz, 40 Hz, 90 Hz, 3 kHz, 7 kHz, 10 kHz and 15 kHz -16.0 dBu signals to ANALOG AUDIO CH-1 and CH-2 connectors.
.Insert a blank tape BCT-20G (OXIDE).
.Put the unit into REC mode about 5 seconds respectively for each signal.

Specifications and adjustment

Step-1
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
40 Hz : 0 ± 2.7 dB
90 Hz : 0 ± 2.7 dB
3 kHz : 0 ± 2.5 dB
7 kHz : 0 ± 2.5 dB
10 kHz: 0 ± 2.5 dB
15 kHz: 0 ± 2.5 dB

Adjustments: CH-1: Confirmation
CH-2: Confirmation

Preparations for adjustment for Step-2

.Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-2
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

1 kHz : reference (0 dB)
40 Hz : 0 ± 2.5 dB
90 Hz : 0 ± 2.5 dB
3 kHz : 0 ± 1.5 dB
7 kHz : 0 ± 1.5 dB
10 kHz: 0 ± 1.5 dB
15 kHz: 0 ± 2.0 dB

If the specification is not satisfied, perform Overall Frequency Response Adjustment (Oxide) in Section 9-18 and Overall Phase Adjustment (Oxide) in Section 9-19.

Adjustments: CH-1: Confirmation
CH-2: Confirmation

NOTE: After adjustment is completed, reset the DOLBY NR switch to OFF.

9-30. LTC REC CURRENT CHECK

Preparations for adjustment

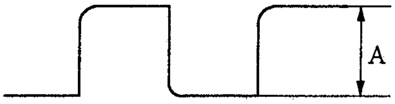
- .No signal input.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode.

Specifications and adjustment

TP701/RP-53P (F-6)
Waveform of the oscilloscope

A = 40 ± 5 mVp-p

Adjustment: Confirmation



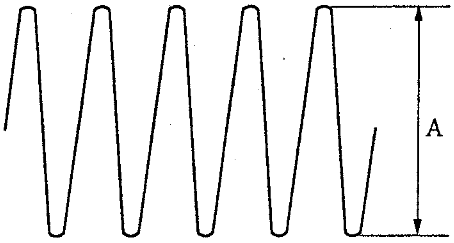
9-31. LTC PB LEVEL CHECK

Preparations for adjustment for Step-1

- .No signal input.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode about 30 seconds.
- .Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-1
TP703/RP-53P (E-6)
Waveform of the oscilloscope



A = more than 70 mVp-p

Adjustment: Confirmation

Preparations for adjustment for Step-2

- .Put the unit into REW, REV x5 and REV x1/5 modes, and play back the self-recorded portion of the tape.

Specifications and adjustment

Step-2
TP703/RP-53P (E-6)
Waveform of the oscilloscope

A = more than 70 mVp-p

Adjustment: Confirmation

Preparations for adjustment for Step-3

- .No signal input.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode about 30 seconds.
- .Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-3
TP703/RP-53P (E-6)
Waveform of the oscilloscope

A = more than 90 mVp-p

Adjustment: Confirmation

Preparations for adjustment for Step-4

- .Put the unit into REW, REV x5 and REV x1/5 modes, and play back the self-recorded portion of the tape.

Specifications and adjustment

Step-4
TP703/RP-53P (E-6)
Waveform of the oscilloscope

A = more than 90 mVp-p

Adjustment: Confirmation

Preparations for adjustment for Step-5

- .Play back an audio 1 kHz 0 VU signal portion (0:00 to 2:55) of an alignment tape CR8-1A PS.

Specifications and adjustment

Step-5
TP703/RP-53P (E-6)
Waveform of the oscilloscope

A = more than 70 mVp-p

Adjustment: Confirmation

9-32. AUDIO CH-1 INSERT CROSSTALK ADJUSTMENT

Preparations for adjustment for Step-1

.Supply a 1 kHz +4.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
.Insert a blank tape BCT-20M (METAL).
.Put the unit into CH-1 INSERT mode (press CH-1 INSERT, PLAY and EDIT buttons).

Specifications and adjustment

Step-1

ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

Minimize the level.

Adjustment: RV402/AU-147P (E-2)

Preparations for adjustment for Step-2

.Change the frequency to 9.0 kHz.

Specifications and adjustment

Step-2

ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

Minimize the level.

Adjustment: RV403/AU-147P (E-3)

Preparations for adjustment for Step-3

.Change the frequency to 16.0 kHz.

Specifications and adjustment

Step-3

ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

Minimize the level.

Adjustment: RV404/AU-147P (E-3)
LV401/AU-147P (D-4)

Preparations for adjustment for Step-4
.Change the frequency to 9.0 kHz.

Specifications and adjustment
Step-4
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

less than -18.0 dBu

Adjustments: RV402/AU-147P (E-2)
RV403/AU-147P (E-3)

Preparations for adjustment for Step-5
.Change the frequency to 16.0 kHz.

Specifications and adjustment
Step-5
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

less than -22.0 dBu

Adjustments: RV403/AU-147P (E-3)
RV404/AU-147P (E-3)
LV401/AU-147P (D-4)

Preparations for adjustment for Step-6
.Change the frequency to 7.0 kHz.

Specifications and adjustment
Step-6
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

less than -18.0 dBu

Adjustment: If the specification is not satisfied, fine adjust using RV403, RV404 and LV401.

Preparations for adjustment for Step-7

.Change the frequency to 10.0 kHz.

Specifications and adjustment

Step-7

ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

less than -18.0 dBu

Adjustment: If the specification is not satisfied, fine adjust using RV403, RV404 and LV401.

Preparations for adjustment for Step-8

.Change the frequency to 12.5 kHz.

Specifications and adjustment

Step-8

ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

less than -22.0 dBu

Adjustment: If the specification is not satisfied, fine adjust using RV403, RV404 and LV401.

Preparations for adjustment for Step-9

.Change the frequency to 16.0 kHz.

Specifications and adjustment

Step-9

ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

less than -18.0 dBu

Adjustment: If the specification is not satisfied, fine adjust using RV403, RV404 and LV401.

9-33. AUDIO CH-2 INSERT CROSSTALK ADJUSTMENT

Preparations for adjustment for Step-1

- .Supply a 1 kHz +4.0 dBu signal to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into CH-2 INSERT mode (press CH-2 INSERT, PLAY and EDIT buttons).

Specifications and adjustment

Step-1

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

Minimize the level.

Adjustment: RV302/AU-147P (D-2)

Preparations for adjustment for Step-2

- .Change the frequency to 9.0 kHz.

Specifications and adjustment

Step-2

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

Minimize the level.

Adjustment: RV303/AU-147P (D-3)

Preparations for adjustment for Step-3

- .Change the frequency to 16.0 kHz.

Specifications and adjustment

Step-3

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

Minimize the level.

Adjustments: RV304/AU-147P (D-3)
LV301/AU-147P (D-4)

Preparations for adjustment for Step-4

.Change the frequency to 9.0 kHz.

Specifications and adjustment

Step-4

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

less than -18.0 dBu

Adjustments: RV302/AU-147P (D-2)
RV303/AU-147P (D-3)

Preparations for adjustment for Step-5

.Change the frequency to 16.0 kHz.

Specifications and adjustment

Step-5

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

less than -22.0 dBu

Adjustments: RV303/AU-147P (D-3)
RV304/AU-147P (D-3)
LV301/AU-147P (D-4)

Preparations for adjustment for Step-6

.Change the frequency to 7.0 kHz.

Specifications and adjustment

Step-6

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

less than -18.0 dBu

Adjustment: If the specification is not satisfied, fine adjust using RV303, RV304 and LV301.

Preparations for adjustment for Step-7
.Change the frequency to 10.0 kHz.

Specifications and adjustment
Step-7
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

less than -18.0 dBu

Adjustment: If the specification is not satisfied, fine adjust using RV303, RV304 and LV301.

Preparations for adjustment for Step-8
.Change the frequency to 12.5 kHz.

Specifications and adjustment
Step-8
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

less than -22.0 dBu

Adjustment: If the specification is not satisfied, fine adjust using RV303, RV304 and LV301.

Preparations for adjustment for Step-9
.Change the frequency to 16.0 kHz.

Specifications and adjustment
Step-9
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

less than -18.0 dBu

Adjustment: If the specification is not satisfied, fine adjust using RV303, RV304 and LV301.

9-34. OVERALL CROSSTALK ADJUSTMENT

Preparations for adjustment for Step-1

.Supply a 1 kHz +10.0 dBu signal to ANALOG AUDIO INPUT CH-1 connector.
.Supply no signal input to ANALOG AUDIO INPUT CH-2 connector.
.Insert a blank tape BCT-20G (OXIDE).
.Put the unit into REC mode.

Specifications and adjustment

Step-1
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

Minimize the level.

Adjustment: RV401/AU-147P (E-1)

Preparations for adjustment for Step-2

.Supply a 1 kHz +10.0 dBu signal to ANALOG AUDIO INPUT CH-2 connector.
.Supply no signal input to ANALOG AUDIO INPUT CH-1 connector.
.Put the unit into REC mode.

Specifications and adjustment

Step-2
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

Minimize the level.

Adjustment RV301/AU-147P (D-1)

Preparations for adjustment for Step-3

.Supply a 1 kHz +10.0 dBu signal to ANALOG AUDIO INPUT CH-1 connector.
.Supply no signal input to ANALOG AUDIO INPUT CH-2 connector.
.Put the unit into REC mode.
.Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-3
ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

The level difference between CH-1 and CH-2 should be 65.0 dB or more.

Adjustment: Fine adjust
RV401/AU-147P (E-1)

Preparations for adjustment for Step-4

- .Supply a 1 kHz +10.0 dBu signal to ANALOG AUDIO INPUT CH-2 connector.
- .Supply no signal input to ANALOG AUDIO INPUT CH-1 connector.
- .Put the unit into REC mode.
- .Play back the self-recorded portion of the tape.

Specifications and adjustment

Step-4

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)
ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

The level difference between CH-1 and CH-2 should be 65.0 dB or more.

Adjustment: Fine adjust
RV301/AU-147P (D-1)

Preparations for adjustment for Step-5

- .Insert a blank tape BCT-20M (METAL).
- .Perform Step-1 thru. Step-4 as the same procedures.

Specifications and adjustment

Step-5

Confirm the specifications are satisfied.

Adjustment: Confirmation

9-35. TIME CODE INSERT CROSSTALK ADJUSTMENT

Preparations for adjustment

- .Supply a 1 kHz +4.0 dBu signal to TIME CODE IN connector.
- .Supply no signal input to ANALOG AUDIO INPUT CH-1 and CH-2 connectors.
- ,Set TC EXT/INT switch on the subcontrol panel to EXT.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into TIME CODE INSERT mode (press TIME CODE INSERT, PLAY and EDIT buttons).

Specifications and adjustment

Step-1

ANALOG AUDIO OUTPUT CH-1 (terminated with 600-ohm)

Minimize the level.
(The level should be less than -18.0 dBm.)

Adjustments: RV351/AU-147P (C-5)
RV352/AU-147P (C-5)
RV353/AU-147P (C-5)

Specifications and adjustment

Step-2

ANALOG AUDIO OUTPUT CH-2 (terminated with 600-ohm)

Minimize the level.
(The level should be less than -18.0 dBm.)

Adjustments: RV451/AU-147P (D-5)
RV452/AU-147P (D-5)
RV453/AU-147P (D-5)

NOTE: After adjustments are completed, reset TC EXT/INT switch to INT.

9-36. AES/EBU INPUT D/A LEVEL ADJUSTMENT

Preparations for adjustment for Step-1

.Convert an analog 1.0 kHz + 4.0 dBu signal to digital signal, and supply an encorded digital signal which is satisfied with the AES/EBU format to DIGITAL AUDIO INPUT CH-1/2 connector.
.Set AUDIO INPUT SELECT switch on the control panel to DIGITAL.
.Set DIGITAL AUDIO INPUT switch on the subcontrol panel to AES/EBU.
.Set DIGITAL AUDIO EMPHASIS switch on the subcontrol panel to OFF.
.EE mode

Specifications and adjustment

Step-1
CH-1: TP103/AU-147P (G-3)
CH-2: TP203/AU-147P (E-3)

-10.0 ± 0.1 dBu

Adjustments: CH-1: RV400/DIF-11P (R-7)
CH-2: RV402/DIF-11P (R-7)

Preparations for adjustment for Step-2

.Convert an analog 1.0 kHz + 4.0 dBu signal to digital signal, and supply an encorded digital signal which is satisfied with the AES/EBU format to DIGITAL AUDIO INPUT CH-3/4 connector.
.EE mode

Specifications and adjustment

Step-2
CH-3: TP302/AFM-8 (F-7)
CH-4: TP502/AFM-8 (G-7)

-1.0 ± 0.1 dBu

Adjustments: CH-3: RV404/DIF-11P (N-7)
CH-4: RV406/DIF-11P (M-7)

NOTE: After adjustments are completed, reset AUDIO INPUT SELECT switch, DIGITAL AUDIO INPUT switch and DIGITAL AUDIO EMPHASIS switch to the former positions.

9-37. AES/EBU OUTPUT A/D LEVEL ADJUSTMENT

Preparations for adjustment for Step-1

- .Convert an analog 1.0 kHz + 4.0 dBu signal to digital signal, and supply an encorded digital signal which is satisfied with the AES/EBU format to DIGITAL AUDIO INPUT CH-1/2 connector.
- .Set AUDIO INPUT SELECT switch on the control panel to DIGITAL.
- .Set DIGITAL AUDIO INPUT switch on the subcontrol panel to AES/EBU.
- .Set DIGITAL AUDIO EMPHASIS switch on the subcontrol panel to OFF.
- .EE mode

Specifications and adjustment

Step-1

DIGITAL AUDIO OUTPUT CH-1 connector
DIGITAL AUDIO OUTPUT CH-2 connector

+4.0 ± 0.1 dBm

Adjustments: CH-1: RV600/DIF-11P (P-1)
CH-2: RV602/DIF-11P (R-1)

Preparations for adjustment for Step-2

- .Convert an analog 1.0 kHz + 4.0 dBu signal to digital signal, and supply an encorded digital signal which is satisfied with the AES/EBU format to DIGITAL AUDIO INPUT CH-3/4 connector.
- .EE mode

Specifications and adjustment

Step-2

DIGITAL AUDIO OUTPUT CH-3 connector
DIGITAL AUDIO OUTPUT CH-4 connector

+4.0 ± 0.1 dBm

Adjustments: CH-3: RV604/DIF-11P (L-1)
CH-4: RV606/DIF-11P (M-1)

NOTE: After adjustments are completed, reset AUDIO INPUT SELECT switch, DIGITAL AUDIO INPUT switch and DIGITAL AUDIO EMPHASIS switch to the former positions.

SECTION 10

VIDEO SYSTEM ALIGNMENT

(Equipment Required)

.Oscilloscope	(TEKTRONIX 2445 or equivalent)
.Signal Genrator	
Serial Digital	(TEKTRONIX TSG-422 OP-1S or equivalent)
Component	(TEKTRONIX TSG-300 MOD SP1 or equivalent) (LEADER 425 BETACAM SP SPEC.)
Composite	(TEKTRONIX 1411 or equivalent) (LEADER 425 BETACAM SP SPEC.)
Y/C	(TEKTRONIX TSG-131 or equivalent) (LEADER 425 BETACAM SP SPEC.)
Digital Composite	(TEKTRONIX TSG-271 or equivalent) (LEADER 425 BETACAM SP SPEC.)
.D/A A/D Convertor	
PFV-D100 with BKPF-102C	(SONY)
PFV-D100 with BKPF-101C	(SONY)
D/A Convertor Box	(TEKTRONIX or equivalent)
.Network Analyzer	(ANRITSU MS-420B or equivalent)
.Waveform Monitor	
VM-700A or equivalent	
Component	(TEKTRONIX WFM300/WFM300A/1781 or equivalent)
Composite	(TEKTRONIX 1481C/1751/1781R or equivalent)
.Spectrum Analyzer	(ADVANTEST R4131 B/D or equivalent)
.Sweep Generator	(SHIBASOKU VS-12CX/2 or equivalent)
.Current Prove	(TEKTRONIX P6022 or equivalent)
.Picture Monitor	
.Deviation Checker	(SONY EW-580)
.Head Coupling Tool	
.Frequency Counter	
.Blank Tape (oxide)	BCT-20G
.Blank Tape (metal)	BCT-20M

NOTE: "Blank Tape" indicates a cassette tape on which no video/audio signals are recorded. (An CTL signal is only recorded.)

.Alignment Tape CR5-1BPS (part No. 8-960-096-91)
Contents

TIME (min s)	VIDEO TRACK	AFM
0:00 to 2:00	RF Sweep Marker 1, 2, 4, 6, 8, 10, 12 MHz	No Signal
2:00 to 5:00	60% H Sweep (CTDM) Marker 0.5, 1, 2, 3, 4, 5 MHz	No Signal
5:00 to 8:00	Pulse & Bar (CTDM)	No Signal
8:00 to 11:00	Multi Burst Y: 0.5, 1, 2, 4.5, 5.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz	No Signal
11:00 to 14:00	Pulse & Bar	No Signal
14:00 to 16:30	100% Color-bar	400 Hz Sine Wave 25 kHz Deviation
16:30 to 17:00	100% Color-bar	400 Hz Sine Wave 75 kHz Deviation
17:00 to 19:00	50% Bowtie & 10T	No Signal
19:00 to 22:00	Line 17A	No Signal
22:00 to 24:00	Quad Phase	No Signal
24:00 to 26:00	50% Flat Field	No Signal
26:00 to 28:00	100% Color-bar with Dropout	No Signal
28:00 to 30:00	Composite H Sweep with VISC	No Signal

.Alignment Tape CR5-2A PS (part No. 8-960-098-44)
Contents

TIME (min s)	VIDEO TRACK
0:00 to 3:00	75% Color-bar
3:00 to 6:00	60% Multi Burst Y: 0.5, 1, 2, 3, 4.1, 4.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz
6:00 to 9:00	50% Bowtie & 10T
9:00 to 11:00	Pulse & Bar
11:00 to 13:00	Quad Phase
13:00 to 15:00	C-Monoscope Switching position is shifted.

(Switch Setting)

Following setting should not be changed in position unless otherwise specified.

<Upper Control Panel>
REMOTE/LOCAL: LOCAL
TRACKING: FIXED
AUDIO INPUT SELECT: ANALOG
AUDIO MIXING: OFF
AUDIO MONITOR: ST/AFM
REC level control (CH-1 to CH-4): preset (push)
PB level control (CH-1 to CH-4): preset (push)

<Lower Control Panel>
DT SELECT: OFF
CTL/TC/U-BIT: CTL
PB/PB/EE: PB/EE
CONFI: ON

<Sub Control Panel>
CAPSTAN LOCK: 2FD
TC EXT/INT: INT
REC INHIBIT: OFF
TBC CONTROL: LOCAL
Y/C DELAY: PRESET
BLACK LEVEL: PRESET
CHROMA: PRESET
VIDEO: PRESET
DIGITAL AUDIO INPUT: AES/EBU
DIGITAL AUDIO EMPHASIS: OFF
AFM INPUT: CH-3/4

<System Control Panel>
VITC: ON
SYNCHRONIZE: ON
CHARACTER: ON
VTR CONTROL: INT
TBC REF: INPUT VIDEO
LEVEL REF: OFF

<Connector panel>
REF VIDEO INPUT 75-ohm: ON
AUDIO INPUT LEVEL (CH-1 to CH-4): HIGH
AUDIO INPUT 600-ohm (CH-1 to CH-4):ON

<DIF Board Switch Setting>
S102 (C-1): OFF
S801 (J-1): OFF
S800 (H-1): 0

<MDM Board Switch Setting>
S901 Bit-1 to Bit-4 (L-1): All OFF
S902 Bit-1 to Bit-8 (K-1): All OFF
S401 (B-1): OFF (Y NR OFF)
S801 (G-1): OFF (C NR OFF)
S1601 (E-4): Y TEST (right side)
S1602 (E-4): C TEST (right side)
S1603 (E-1): Y FS (up side)
S1604 (F-1): C FS (right side)
S1101 (N-5): NR EN OFF (left side)

<TBC Board Switch Setting>
S1 Bit-1 to Bit-8 (J-1): All OFF

NOTE: Color-bar signal

When performing the electrical alignment, the specification of color-bar signal should use 100/0/100/0 color-bar signal without notice.

Operating procedures of VIDEO ADJUST Maintenance Menu

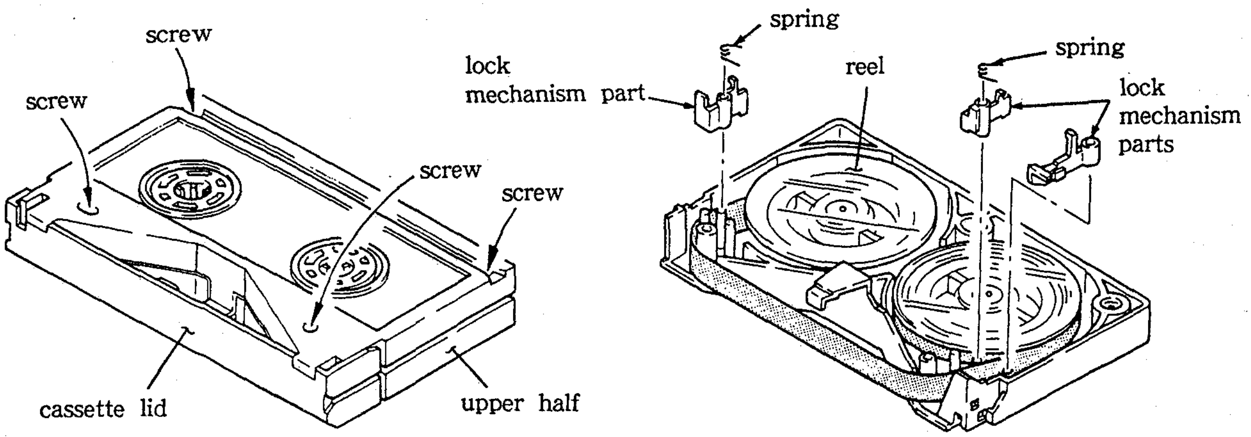
This column describes the operating procedure of the "A1: VIDEO ADJUST" maintenance menu.

1. Turn the POWER to OFF, and set switch S601-4 on SS-48DP board to ON (CLOSE).
2. Turn the POWER to ON.
3. Press the EJECT button to put the unit into EJECT mode.
   NOTE: If the unit is not into EJECT mode, video system adjustment cannot perform.
4. Press switch S302 on SS-48DP board.
   Then the unit put into the maintenance mode, and seven kinds of mode display on the monitor screen.
5. Press search dial to put into jog mode, and move * mark to "A1: VIDEO ADJUST" displaying on the monitor screen with the search dial.
6. Press switch S302 on SS-48DP board.
   By this operation, "A1: VIDEO ADJUST" is selected.
   "RF ADJUST" menu will display on the monitor screen.
7. Move * mark to desired ITEM with the search dial (in jog mode).
8. Press switch S302 on SS-48DP board, and execute the * marked ITEM.
9. While pressing the SEARCH button, turn the search dial to meet the specification of each adjustment.
10. After adjustment is completed, press switch S304 on SS-48DP board, and confirm that "DATA SET COMPLETED" is displayed on the monitor screen.

How to make a blank cassette tape without tape

This tape is used in RF system adjustment.

1. Remove four fixing screws on the back of the cassette tape as shown in the figure, and remove an upper half of the cassette.
2. Remove the lock mechanism parts and the springs both at left and right sides, and remove the cassette lid from the upper half.
3. Remove cassette reels from the lower half.
4. Install the upper half on the lower half with four screws from the back side.

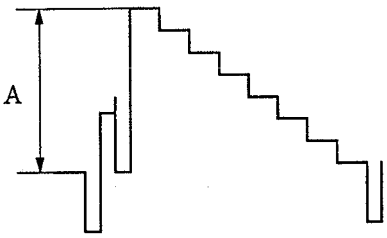

screw
screw
screw
screw
cassette lid
upper half
lock
mechanism part
spring
reel
spring
lock
mechanism
parts

10-1. DIF-11P BOARD ADJUSTMENT

10-1-1. Y Video Level Adjustment

Preparations for adjustment
- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment
TP100/DIF-11P (E-5)
Waveform of the oscilloscope
(INVERT mode)



A = 700 ± 10 mVp-p

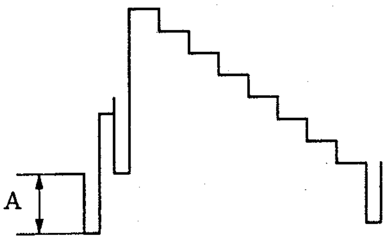
Adjustment: For A adjustment (WHITE PEAK)
RV103/DIF-11P (C-6)

TRIG: TP100/DIF-11P (E-5)

10-1-2. Y Composite Sync Level Adjustment

Preparations for adjustment
- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment
TP100/DIF-11P (E-5)
Waveform of the oscilloscope
(INVERT mode)



A = 300 ± 10 mVp-p

Adjustment: RV106/DIF-11P (F-5)

TRIG: TP100/DIF-11P (E-5)

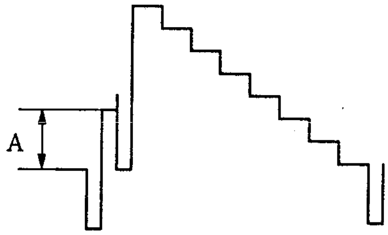
10-1-3. Y Reference Sync Level Adjustment

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP100/DIF-11P (E-5)
Waveform of the oscilloscope
(INVERT mode)



A = 375 ± 10 mVp-p

Adjustment: RV107/DIF-11P (E-5)

TRIG: TP100/DIF-11P (E-5)

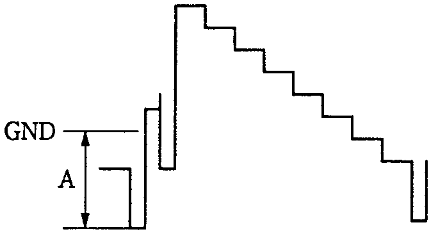
10-1-4. Y DC Offset Level Adjustment

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP100/DIF-11P (E-5)
Waveform of the oscilloscope
(INVERT mode)



Measuring at sync portion
A = -0.50 ± 0.02 Vdc

Adjustment: RV104/DIF-11P (D-6)

TRIG: TP100/DIF-11P (E-5)

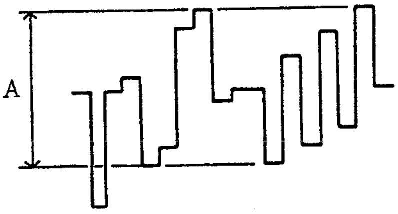
10-1-5. C Video Level Adjustment

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP101/DIF-11P (E-7)
Waveform of the oscilloscope
(INVERT mode)



A = 700 ± 10 mVp-p

Adjustment: RV108/DIF-11P (C-6)

TRIG: TP101/DIF-11P (E-7)

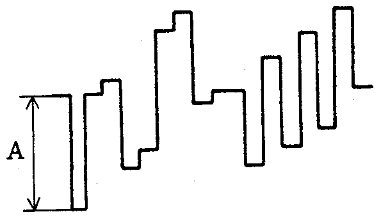
10-1-6. C Reference Sync Level Adjustment

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP101/DIF-11P (E-7)
Waveform of the oscilloscope
(INVERT mode)



A = 630 ± 10 mVp-p

Adjustments: RV111/DIF-11P (E-6)

TRIG: TP101/DIF-11P (E-7)

10-1-7. C DC Offset Level Adjustment

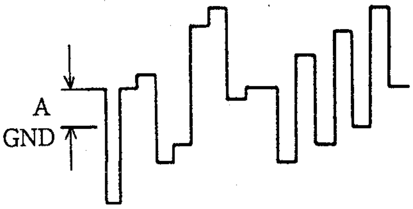
Preparations for adjustment
- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP101/DIF-11P (E-7)

Waveform of the oscilloscope

(INVERT mode)



Measuring at pedestal portion

A = 0 ± 50 mVdc

Adjustment: RV109/DIF-11P (D-6)

TRIG: TP101/DIF-11P (E-7)

10-1-8. CF ID Level Adjustment

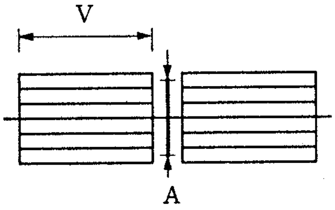
Preparations for adjustment
- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP101/DIF-11P (E-7)

Waveform of the oscilloscope

(INVERT mode)



A = 525 ± 40 mVp-p

Adjustment: RV110/DIF-11P (F-6)

TRIG: TP101/DIF-11P (E-7)

10-1-9. S/P VCO Frequency Adjustment

Preparations for adjustment

- .Perform this adjustment 10 min. or more later after turn ON the POWER.
- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Connect a frequency counter to OUTPUT terminal of an oscilloscope.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Preparations for adjustment

Step-1

.Short between TP105 (D-3) and E102 (E-3) on DIF-11P board using a shorting clip lead.

Specifications and adjustment

Step-1

TP106/DIF-11P (D-2)
Frequency counter

26.3 ± 0.1 MHz D102/DIF-11P (A-1) turns off.

Adjustment: RV102/DIF-11P (C-3)

Preparations for adjustment

Step-2

.Remove the shorting clip lead.

Specifications and adjustment

Step-2

TP106/DIF-11P (D-2)
Frequency counter

27.0 ± 0.1 MHz D102/DIF-11P (A-1) turns on.

Adjustment: Confirmation

TRIG: TP106/DIF-11P (D-2)

10-1-10. P/S VCO Frequency Adjustment

Preparations for adjustment

- .Perform this adjustment 10 min. or more later after turn ON the POWER.
- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Connect a frequency counter to OUTPUT terminal of an oscilloscope.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Step-1

.Short between TP800 (E-3) and E800 (F-3) on DIF-11P board using a shorting clip lead.

Specifications and adjustment

Step-1

TP801/DIF-11P (E-3)
Frequency counter

26.9 ± 0.1 MHz D800/DIF-11P (E-1) turns off.

Adjustment: RV801/DIF-11P (E-3)

Preparations for adjustment

Step-2

.Remove the shorting clip lead.

Specifications and adjustment

Step-2

TP801/DIF-11P (E-3)
Frequency counter

27.0 ± 0.1 MHz D800/DIF-11P (E-1) turns on.

Adjustment: Confirmation

TRIG: TP801/DIF-11P (E-3)

NOTE: Afer this adjustment is completed, perform Section 10-2-1. Y HIC Input Level Adjustment and later.

10-2. MDM-5P/PA-109 BOARDS ADJUSTMENT

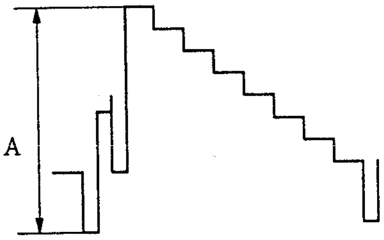
10-2-1. Y HIC Input Level Adjustment

Preparations for adjustment

- . Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- . Insert a blank tape BCT-20M (METAL).
- . EE mode

Specifications and adjustment

TP1105/MDM-5P (K-6)
Waveform of the oscilloscope
(INVERT mode)



A = 1.00 ± 0.01 Vp-p

Adjustment: RV1103/MDM-5P (K-6)

TRIG: TP1105/MDM-5P (K-6)

10-2-2. Y Non-linear Pre-emphasis Input Level Adjustment

Preparations for adjustment

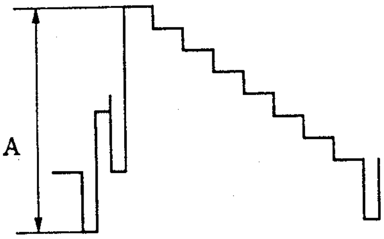
- . Supply a 100% color-bar signal to SERIAL V/A INPUT connector.

Step-1

- . Insert a blank tape BCT-20M (METAL).
- . EE mode

Specifications and adjustment

Step-1
TP1106/MDM-5P (L-6)
Waveform of the oscilloscope
(INVERT mode)



A = 1.00 ± 0.01 Vp-p

Adjustment: RV1101/MDM-5P (N-1)

Preparations for adjustment

Step-2

- . Insert a blank tape BCT-20G (OXIDE).
- . EE mode

Specifications and adjustment
Step-2
TP1106/MDM-5P (L-6)

A = 1.00 ± 0.01 Vp-p

Adjustment: RV1102/MDM-5P (P-1)

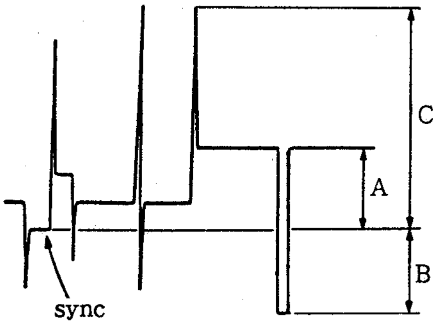
TRIG: TP1106/MDM-5P (L-6)

10-2-3. Y White Clip and Dark Clip Adjustments (Metal)

Preparations for adjustment

- Supply a pulse and bar signal to SERIAL V/A INPUT connector.
- Board suffix is -11: Short between HIC1101-pin17 and GND on MDM-5P board with a 47 pF capacitor.
  Board suffix is -12: Short between TP1116 (K-4) and TP1117 (K-4) on MDM-5P board with shorting clip lead.
- Insert a blank tape BCT-20M (METAL).
- EE mode

Specifications and adjustment
TP1115/MDM-5P (L-4)
Waveform of the oscilloscope



A (from sync tip to white peak) = Reference 100%
B (from sync tip to dark clip) = 150 ± 5 %
C (from sync tip to white clip) = 300 ± 5 %

Adjustment: For B (dark clip adjustment)
RV1113/MDM-5P (M-5)
For C (white clip adjustment)
RV1111/MDM-5P (M-4)

NOTE: After adjustment is completed, remove the capacitor or shorting clip lead.

TRIG: TP1115/MDM-5P (L-4)

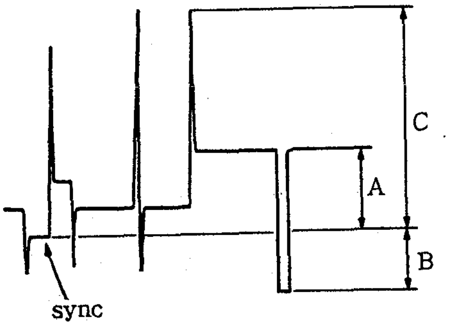
10-2-4. Y White Clip and Dark Clip Adjustments (Oxide)

Preparations for adjustment

- .Supply a pulse and bar signal to SERIAL V/A INPUT connector.
- .Board suffix is -11: Short between HIC1101-pin17 and GND on MDM-5P board with a 47 pF capacitor.
  Board suffix is -12: Short between TP1116 (K-4) and TP1117 (K-4) on MDM-5P board with shorting clip lead.
- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

TP1115/MDM-5P (L-4)
Waveform of the oscilloscope



A (from sync tip to white peak) = Reference 100%
B (from sync tip to dark clip) = 65 ± 5 %
C (from sync tip to white clip) = 250 ± 5 %

Adjustment: For B (dark clip adjustment)
RV1114/MDM-5P (M-5)
For C (white clip adjustment)
RV1112/MDM-5P (M-4)

NOTE: After adjustment is completed, remove the capacitor or shorting clip lead.

TRIG: TP1115/MDM-5P (L-4)

10-2-5. Y Deviation Adjustment (Metal)

(1) Adjusting procedure using a deviation checker

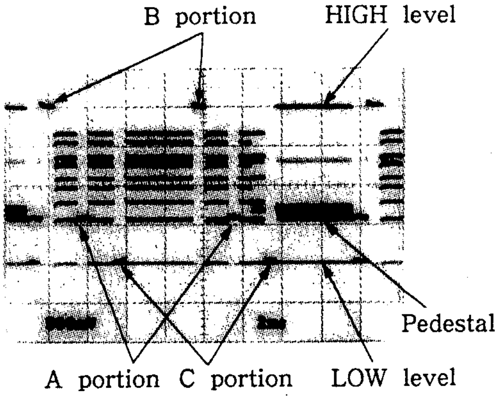
.Connect a probe of a oscilloscope to VIDEO OUT terminal of deviation checker.
.Connect TP1122/MDM-5P (M-7) to RF IN terminal of deviation checker.

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Set the switches of the deviation checker as follows:
  - NTSC/PAL: PAL
  - METAL/OXIDE: METAL
  - Y/C: Y
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP1122/MDM-5P (M-7)
Waveform of the oscilloscope



(A) Pedestal and A portion should be in line.
(B) B portion and the high level, C portion and the low level should be in line.

Adjustment: For (A) Y Carrier
RV1109/MDM-5P (K-4)
For (B) Y Deviation
RV1108/MDM-5P (L-4)

TRIG: TP901/MDM-5P (N-1)

(2) Adjusting procedure using a spectrum analyzer

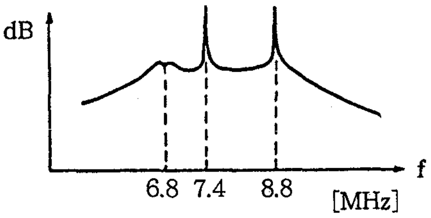
.Connect a spectrum analyzer to the OUTPUT terminal of an oscilloscope.

Preparations for adjustment

- .Supply a 100% flat field signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP1122/MDM-5P (M-7)
Picture of the spectrum analyzer



(A) The center peak level should be 7.4 MHz.
(B) The interval between the two peak levels (7.4 MHz and 8.8 MHz) should be 1.4 MHz.

Adjustment: For (A) Y Carrier
RV1109/MDM-5P (K-4)
For (B) Y Deviation
RV1108/MDM-5P (L-4)

TRIG: TP901/MDM-5P (N-1)

10-2-6. Y Deviation Adjustment (Oxide)

(1) Adjusting procedure using a deviation checker

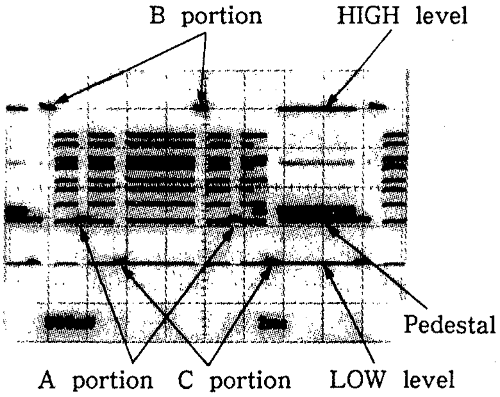
.Connect a probe of a oscilloscope to VIDEO OUT terminal of deviation checker.
.Connect TP1122/MDM-5P (M-7) to RF IN terminal of deviation checker.

Preparations for adjustment

.Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
.Set the switches of the deviation checker as follows:
NTSC/PAL: PAL
METAL/OXIDE: OXIDE
Y/C: Y
.Insert a blank tape BCT-20G (OXIDE).
.EE mode

Specifications and adjustment

TP1122/MDM-5P (M-7)
Waveform of the oscilloscope



(A) Pedestal and A portion should be in line.
(B) B portion and the high level, C portion and the low level should be in line.

Adjustment: For (A) Y Carrier
RV1110/MDM-5P (K-5)
For (B) Y Deviation
Confirmation

(If not to meet the specification, fine adjust using RV1102/MDM-5P (P-1))

TRIG: TP901/MDM-5P (N-1)

(2) Adjusting procedure using a spectrum analyzer

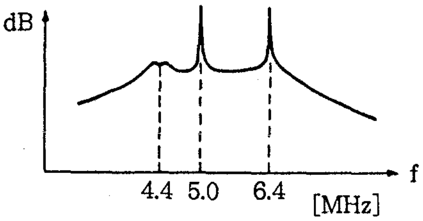
.Connect a spectrum analyzer to the OUTPUT terminal of an oscilloscope.

Preparations for adjustment

- .Supply a 100% flat field signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

TP1122/MDM-5P (M-7)
Picture of the spectrum analyzer



(A) The center peak level should be 5.0 MHz.
(B) The interval between the two peak levels (5.0 MHz and 6.4 MHz) should be 1.4 MHz.

Adjustment: For (A): Y Carrier
RV1110/MDM-5P (K-5)
For (B): Y Deviation
Confirmation

(If not to meet the specification, fine adjust using RV1102/MDM-5P (P-1))

TRIG: TP901/MDM-5P (N-1)

10-2-7. Y Modulator Carrier Balance Adjustment

Preparations for adjustment

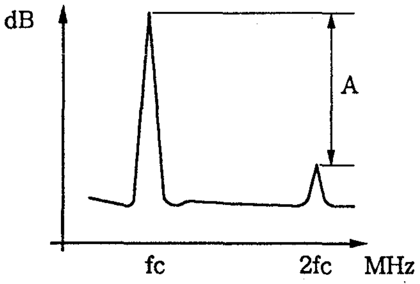
- .Supply a 50% flat field signal to SERIAL V/A INPUT connector.
- .Connect a spectrum analyzer to the OUTPUT terminal of an oscilloscope.
- .Set S901 bit-1 and bit-2 on the MDM-5P board (L-1) to ON, and S902 bit-8 on MDM-5P board (K-1) to ON.

Step-1

- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

Step-1
TP1122/MDM-5P (M-7)
Picture of spectrum analyzer



A: more than 40 dB

Adjustment: RV1115/MDM-5P (L-4)

Preparations for adjustment

Step-2

- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

Step-2

A: more than 40 dB

Adjustment: Confirmation

NOTE: After adjustments are completed, reset S901 bit-1 and bit-2 on MDM-5P board (L-1) to OFF, and S902 bit-8 on the MDM-5P board (K-1) to OFF.

TRIG: TP1122/MDM-5P (M-7)

10-2-8. C HIC Input Level Adjustment

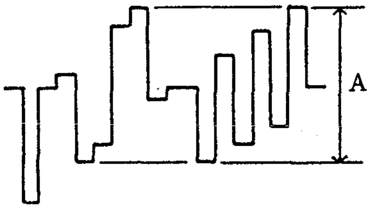
Preparations for adjustment

.Supply a 100% color-bar signal to SERIAL V/A INPUT connector.

Step-1
.Insert a blank tape BCT-20M (METAL).
.EE mode

Specifications and adjustment

Step-1
TP1502/MDM-5P (N-6)
Waveform of the oscilloscope
(INVERT mode)



A = 400 ± 10 mVp-p

Adjustment: RV1501/MDM-5P (P-1)

Preparations for adjustment

Step-2
.Insert a blank tape BCT-20G (OXIDE).
.EE mode

Specifications and adjustment

Step-2
TP1502/MDM-5P (N-6)
Waveform of the oscilloscope
(INVERT mode)

A = 400 ± 10 mVp-p

Adjustment: RV1502/MDM-5P (P-1)

TRIG: TP1502/MDM-5P (N-6)

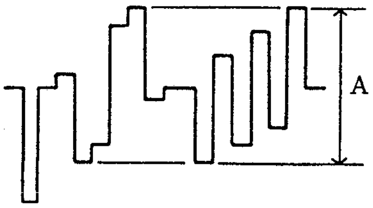
10-2-9. C Non-linear Pre-emphasis Input Level Adjustment

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP1506/MDM-5P (P-6)
Waveform of the oscilloscope



A = 933 ± 10 mVp-p

Adjustment: RV1503/MDM-5P (N-6)

TRIG: TP1506/MDM-5P (P-6)

10-2-10. C Clip Adjustments (Metal)

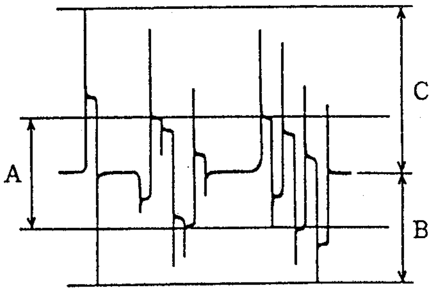
- .Before performing this adjustment, perform Section 10-2-8. C HIC input level adjustment.

Preparations for adjustment

- .Supply a 100% color bar signal to SERIAL V/A INPUT connector.
- .Board suffix is -11: Short between HIC1101-pin17 and GND on MDM-5P board with a 47 pF capacitor.
  Board suffix is -12: Short between TP1116 (K-4) and TP1117 (K-4) on MDM-5P board with shorting clip lead.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP1515/MDM-5P (P-4)
Waveform of the oscilloscope



A (from low level to high level) = Reference 100%
B (from pedestal to low clip) = 195 ± 5 %
C (from pedestal to high clip) = 285 ± 5 %

Adjustment: For B (low clip adjustment)
RV1513/MDM-5P (R-5)
For C (high clip adjustment)
RV1511/MDM-5P (R-5)

TRIG: TP1515/MDM-5P (P-4)

NOTE: After adjustment is completed, remove the capacitor.

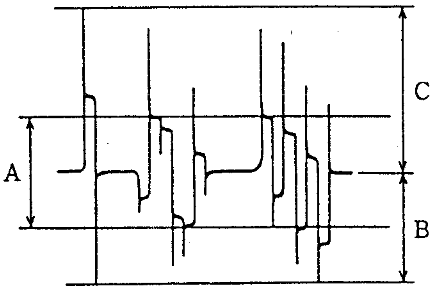
10-2-11. C Clip Adjustments (Oxide)

Preparations for adjustment

- .Supply a 100% color bar signal to SERIAL V/A INPUT connector.
- .Board suffix is -11: Short between HIC1101-pin17 and GND on MDM-5P board with a 47 pF capacitor.
  Board suffix is -12: Short between TP1116 (K-4) and TP1117 (K-4) on MDM-5P board with shorting clip lead.
- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

TP1515/MDM-5P (P-4)
Waveform of the oscilloscope



A (from low level to high level) = Reference 100%
B (from pedestal to low clip) = 130 ± 5 %
C (from pedestal to high clip) = 225 ± 5 %

Adjustment: For B (low clip adjustment)
RV1514/MDM-5P (P-5)
For C (high clip adjustment)
RV1512/MDM-5P (R-4)

TRIG: TP1515/MDM-5P (P-4)

NOTE: After adjustment is completed, remove the capacitor or shorting clip lead.

10-2-12. C Deviation Adjustment (Metal)

(1) Adjusting procedure using a deviation checker

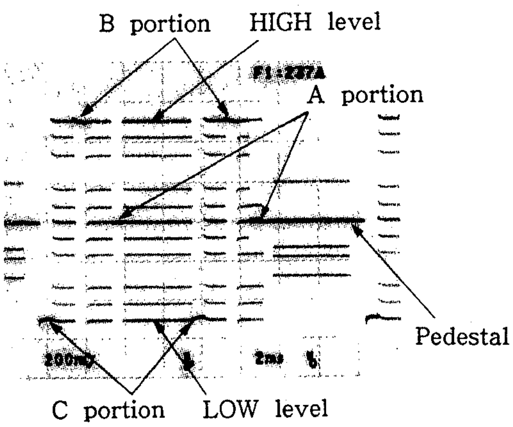
- .Connect a probe of a oscilloscope to VIDEO OUT terminal of deviation checker.
- .Connect TP1522/MDM-5P (R-7) to RF IN terminal of deviation checker.

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Set the switches of the deviation checker as follows:
  - NTSC/PAL: PAL
  - METAL/OXIDE: METAL
  - Y/C: C
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP1522/MDM-5P (R-7)
Waveform of the oscilloscope



(A) Pedestal and A portion should be in line.
(B) B portion and the high level, C portion and the low level should be in line.

Adjustment: For (A) C Carrier
RV1509/MDM-5P (N-4)
For (B) C Deviation
RV1508/MDM-5P (P-4)

TRIG: TP901/MDM-5P (N-1)

(2) Adjusting procedure using a spectrum analyzer

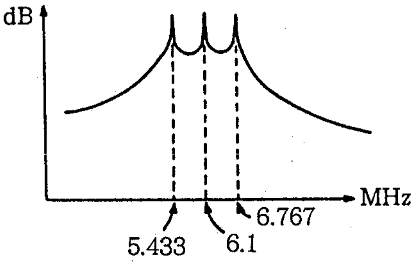
.Connect a spectrum analyzer to the OUTPUT terminal of an oscilloscope.

Preparations for adjustment

.Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20M (METAL).
.EE mode

Specifications and adjustment

TP1522/MDM-5P (R-7)
Picture of the spectrum analyzer



(A) The center peak level should be 6.1 MHz.
(B) The interval between the two peak levels (5.433 MHz and 6.767 MHz) should be 1.334 MHz.

Adjustment: For (A): Y Carrier
RV1509/MDM-5P (N-4)
For (B): Y Deviation
RV1508/MDM-5P (P-4)

TRIG: TP901/MDM-5P (N-1)

10-2-13. C Deviation Adjustment (Oxide)

(1) Adjusting procedure using a deviation checker

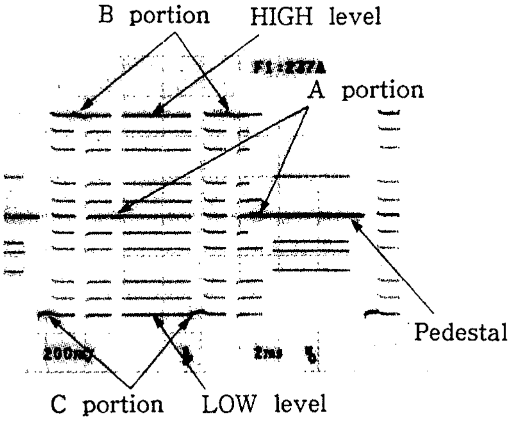
- .Connect a probe of a oscilloscope to VIDEO OUT terminal of deviation checker.
- .Connect TP1522/MDM-5P (R-7) to RF IN terminal of deviation checker.

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Set the switches of the deviation checker as follows:
  - NTSC/PAL: PAL
  - METAL/OXIDE: OXIDE
  - Y/C: C
- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

TP1522/MDM-5P (R-7)
Waveform of the oscilloscope



(A) Pedestal and A portion should be in line.
(B) B portion and the high level, C portion and the low level should be in line.

Adjustment: For (A) C Carrier
RV1510/MDM-5P (N-4)
For (B) C Deviation
Confirmation
If not to meet the specification, fine adjust using
RV1502/MDM-5P (P-1).

TRIG: TP901/MDM-5P (N-1)

(2) Adjusting procedure using a spectrum analyzer

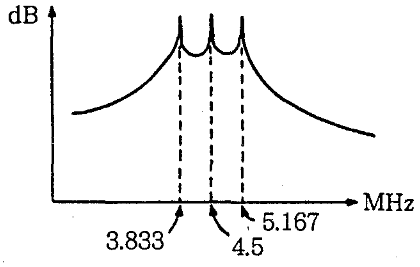
.Connect a spectrum analyzer to the OUTPUT terminal of an oscilloscope.

Preparations for adjustment

.Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20G (OXIDE).
.EE mode

Specifications and adjustment

TP1522/MDM-5P (R-7)
Picture of the spectrum analyzer



(A) The center peak level should be 4.5 MHz.
(B) The interval between the two peak levels (3.833 MHz and 5.167 MHz) should be 1.334 MHz.

Adjustment: For (A) C Carrier
RV1510/MDM-5P (N-4)
For (B) C Deviation
Confirmation
If not to meet the specification, fine adjust using
RV1502/MDM-5P (P-1).

TRIG: TP901/MDM-5P (N-1)

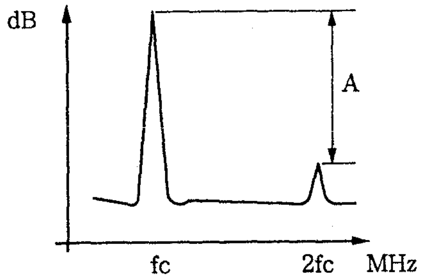
10-2-14. C Modulator Carrier Balance Adjustment

Preparations for adjustment

.Supply a 50% flat field signal to SERIAL V/A INPUT connector.
.Connect a spectrum analyzer to the OUTPUT terminal of an oscilloscope.
Step-1
.Insert a blank tape BCT-20M (METAL).
.EE mode

Specifications and adjustment

Step-1
TP1522/MDM-5P (R-7)
Picture of spectrum analyzer



A: more than 40 dB

Adjustment: RV1515/MDM-5P (P-4)

Preparations for adjustment

Step-2
.Insert a blank tape BCT-20G (OXIDE).
.EE mode

Specifications and adjustment

Step-2

A: more than 40 dB

Adjustment: Confirmation

TRIG: TP1522/MDM-5P (R-7)

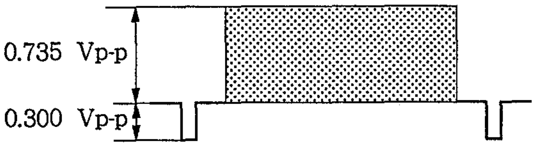
10-2-15. Y REC HF Level Adjustment

Preparations for adjustment

Step-1

- .Supply a sweep signal to SERIAL V/A INPUT connector via A/D convertor.
- .Set the sweep generator (VS12-CX) as follows:

SWEEP : VIDEO
VIDEO : MANUAL
SYNC : MANUAL
BURST : OFF
SETUP : MANUAL

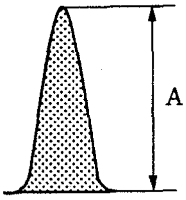


- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

Step-1

TP1103/MDM-5P (M-6)
Waveform of the oscilloscope



A = 110 ± 5 mVp-p

Adjustment: RV1117/MDM-5P (M-6)

TRIG: TP1103/MDM-5P (M-6)

Preparations for adjustment

Step-2

- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

Step-2

TP1103/MDM-5P (M-6)
Waveform of the oscilloscope

A = 150 ± 20 mVp-p

Adjustment: RV1118 on DUS-465/MDM-5P (M-4)

TRIG: TP1103/MDM-5P (M-6)

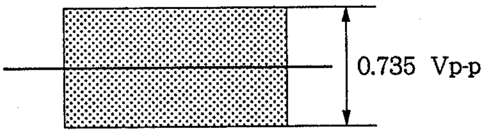
10-2-16. C REC HF Level Adjustment

Preparations for adjustment

Step-1

- .Supply a sweep signal to SERIAL V/A INPUT connector via A/D convertor.
- .Set the sweep generator (VS12-CX) as follows:

SWEEP : VIDEO
VIDEO : MANUAL(0.735 Vp-p)
SYNC : OFF
BURST : OFF
SETUP : OFF

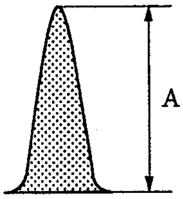


- .Insert a blank tape BCT-20M (METAL)
- .EE mode

Specifications and adjustment

Step-1

TP1503/MDM-5P (P-7)
Waveform of the oscilloscope



A = 120 ± 5 mVp-p

Adjustment: RV1517/MDM-5P (P-7)

TRIG: TP1503/MDM-5P (P-7)

Preparations for adjustment

Step-2

- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

Step-2

TP1503/MDM-5P (M-6)
Waveform of the oscilloscope

A = 120 ± 20 mVp-p

Adjustment: Confirmation

TRIG: TP1503/MDM-5P (M-6)

10-2-17. DT A-ch PB RF Frequency Response Adjustment

Preparations for adjustment

- .Remove a drum cover.
- .Connect a network analyzer to OUTPUT terminal of an oscilloscope.
- .Connect a head coupling tool to OUTPUT terminal of the network analyzer.
- .Set a DT SELECT switch to VAR.
- .Insert a cassette without tape BCT-20M (METAL).
- .Perform the caliblation.
- .EE mode
- .Attach the head coupling tool to DT A-ch head of the drum.

Specifications and adjustment

Step-1

CN119-14B/AFM-8 (B-7)

Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

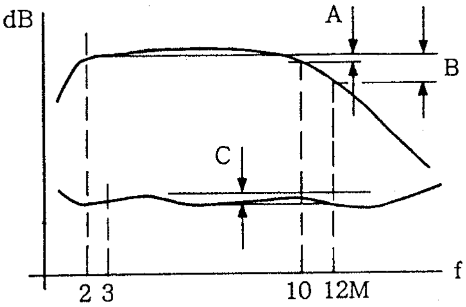
Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2

CN119-14B/AFM-8 (B-7)

Picture of the network analyzer



A (Level difference between 2 MHz to 10 MHz) : 0 ± 0.5 dB
B (Level difference between 2 MHz to 12 MHz) : 1.0 dB or less
C (Deley time between 3 MHz to 12 MHz) : 10 ns or less

Adjustment: (DT-YA)
RV1/PA-109

Specifications and adjustment

Step-3

CN119-23B/AFM-8 (B-7)

Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

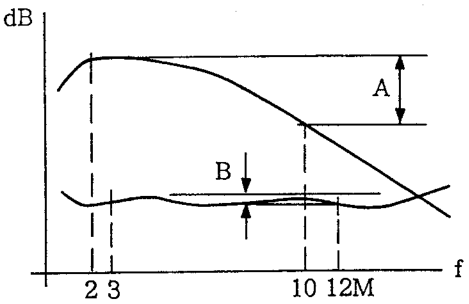
Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-4

CN119-23B/AFM-8 (B-7)

Picture of the network analyzer



A (Level difference between 2 MHz to 10 MHz) : -0.5 +1.0/-1.5 dB
B (Deley time between 4 MHz to 12 MHz) : 10 ns or less

Adjustment: (DT-CA)
Confirmation

TRIG: INT

NOTE 1: After adjustment is completed, remove the head coupling tool, and reset DT SELECT switch to OFF.

NOTE 2: After adjustment is completed, perform Section 10-2-18. DT B-ch PB RF frequency response adjustment and later.

10-2-18. DT B-ch PB RF Frequency Response Adjustment

Preparations for adjustment

- .Remove a drum cover.
- .Connect a network analyzer to OUTPUT terminal of an oscilloscope.
- .Connect a head coupling tool to OUTPUT terminal of the network analyzer.
- .Set a DT SELECT switch to VAR.
- .Insert a cassette without tape BCT-20M (METAL).
- .EE mode
- .Attach the head coupling tool to DT B-ch head of the drum.

Specifications and adjustment

Step-1

CN119-18B/AFM-8 (B-7)

Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

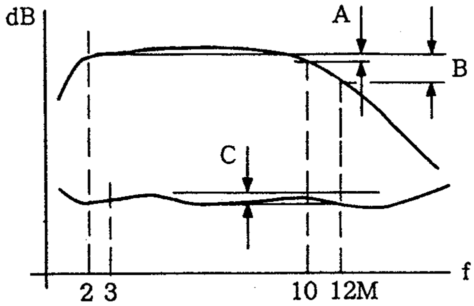
Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2

CN119-18B/AFM-8 (B-7)

Picture of the network analyzer



A (Level difference between 2 MHz to 10 MHz) : 0 ± 0.5 dB
B (Level difference between 2 MHz to 12 MHz) : 1.0 dB or less
C (Deley time between 3 MHz to 12 MH : 10 ns or less

Adjustment: (DT-YB)
RV3/PA-109

Specifications and adjustment

Step-3

CN119-25B/AFM-8 (B-7)

Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

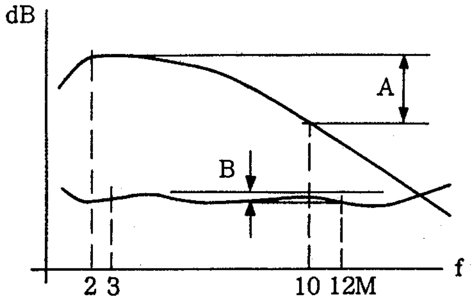
Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-4

CN119-25B/AFM-8 (B-7)

Picture of the network analyzer



A (Level difference between 2 MHz to 10 MHz) : -0.5 +1.0/-1.5 dB
B (Deley time between 4 MHz to 12 MHz) : 10 ns or less

Adjustment: (DT-CB)
Confirmation

TRIG: INT

NOTE 1: After adjustment is completed, remove the head coupling tool, and reset DT SELECT switch to OFF.

NOTE 2: After adjustment is completed, perform Section 10-2-19. RP A-ch PB RF frequency response adjustment and later.

10-2-19. RP A-ch PB RF Frequency Response Adjustment

Preparations for adjustment

- .Remove a drum cover.
- .Connect a network analyzer to OUTPUT terminal of an oscilloscope.
- .Connect a head coupling tool to OUTPUT terminal of the network analyzer.
- .Set a DT SELECT switch to OFF.
- .Insert a cassette without tape BCT-20M (METAL).
- .EE mode
- .Attach the head coupling tool to RP A-ch head of the drum.

Specifications and adjustment

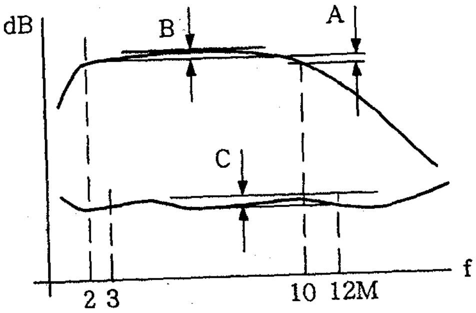
Step-1 (RP-YA)
TP3/RP-53P (C-6)
Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2 (RP-YA)
TP3/RP-53P (C-6)
Picture of the network analyzer



A (Level difference between 2 MHz to 10 MHz) : -0.5 ± 0.5 dB
B (Level difference between 2 MHz to 5 MHz) : 0.5 dB or less
C (Deley time between 3 MHz to 12 MHz) : 10 ns or less

Adjustment: (RP-YA)
RV7/RP-53P (C-6)

Specifications and adjustment

Step-3 (RP-CA)
TP103/RP-53P (B-6)
Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

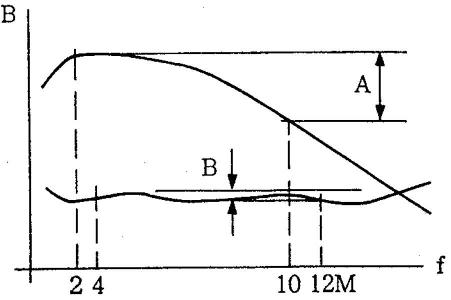
Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-4 (RP-CA)

TP103/RP-53P (B-6)

Picture of the network analyzer



A (Level difference between 2 MHz to 10 MHz) : -3.8 ± 0.5 dB
B (Deley time between 4 MHz to 12 MHz) : 10 ns or less

Adjustment: (RP-CA)
RV107/RP-53P (B-6)

TRIG: INT

NOTE 1: After adjustment is completed, remove the head coupling tool.

NOTE 2: After adjustment is completed, perform Section 10-2-20. RP B-ch PB RF frequency response adjustment and later.

10-2-20. RP B-ch PB RF Frequency Response Adjustment

Preparations for adjustment

.Remove a drum cover.
.Connect a network analyzer to OUTPUT terminal of an oscilloscope.
.Connect a head coupling tool to OUTPUT terminal of the network analyzer.
.Set a DT SELECT switch to OFF.
.Insert a cassette without tape BCT-20M (METEL).
.EE mode
.Attach the head coupling tool to RP B-ch head of the drum.

Specifications and adjustment

Step-1 (RP-YB)

TP4/RP-53P (B-6)

Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

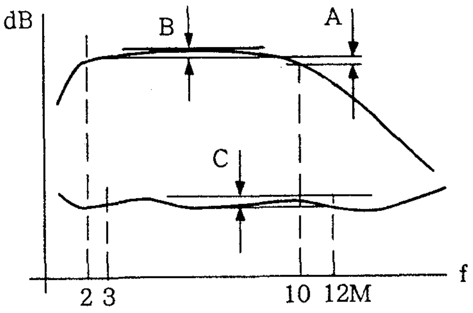
Adjustment: OUTPUT control/Network anlayzer

Specifications and adjustment

Step-2 (RP-YB)

TP4/RP-53P (B-6)

Picture of the network analyzer



A (Level difference between 2 MHz to 10 MHz): -0.5± 0.5 dB
B (Level difference between 2 MHz to 5 MHz) : ±0.5 dB or less
C (Deley time between 3 MHz to 12 MHz) : 10 ns or less

Adjustment: (RP-YB)
RV8/RP-53P (C-6)

Specifications and adjustment

Step-3 (RP-CB)

TP104/RP-53P (A-6)

Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

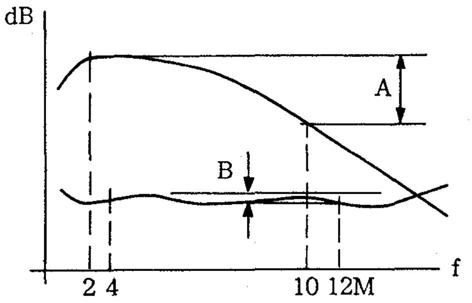
Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-4 (RP-CB)

TP104/RP-53P (A-6)

Picture of the network analyzer



A (Level difference between 2 MHz to 10 MHz) : -3.8 ± 0.5 dB
B (Deley time between 4 MHz to 12 MHz) : 10 ns or less

Adjustment: (RP-CB)
RV108/RP-53P (A-6)

TRIG: INT

NOTE: After adjustment is completed, remove the head coupling tool, and install the drum cover.

10-2-21. Y RF Phase Equalizer Adjustment (Metal)

Preparations for adjustment

- .Connect a network analyzer to OUTPUT terminal of an oscilloscope.
- .Connect the OUTPUT terminal of the network analyzer to TP104/MDM-5P board (A-7).
- .Disconnect a plug from COR101/MDM-5P board (B-7), and connect the plug to COR102/MDM-5P board (B-7).
- .Insert a blank tape BCT-20M (METAL).
- .Perform the caliblation.
- .EE mode

Specifications and adjustment

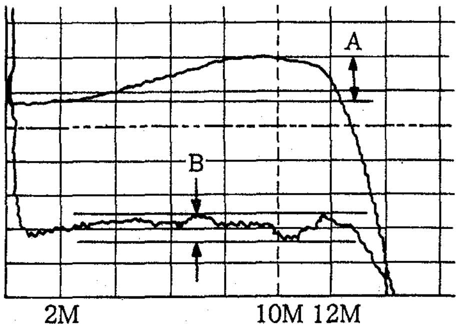
Step-1
TP107/MDM-5P (B-5)
Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2
TP107/MDM-5P (B-5)
Picture of the network analyzer via oscilloscope



A (Gain difference between 1 MHz to 12 MHz) : 3 dB or less
B (Deley time between 1 MHz to 12 MHz) : 20 ns or less

Adjustment: RV1/MDM-5P (B-6)
RV2/MDM-5P (B-6)

TRIG: INT

NOTE: After adjustment is completed, disconnect the plug from COR102/MDM-5P board, and connect the plug to COR101/MDM-5P board.

10-2-22. Y RF LPF Phase Equalizer Adjustment (Oxide)

Preparations for adjustment

- .Connect a network analyzer to OUTPUT terminal of an oscilloscope.
- .Connect the OUTPUT terminal of the network analyzer to TP104/MDM-5P board (A-7).
- .Disconnect a plug from COR101/MDM-5P board (B-7), and connect the plug to COR102/MDM-5P board (B-7).
- .Insert a blank tape BCT-20G (OXIDE).
- .Perform the caliblation.
- .EE mode

Specifications and adjustment

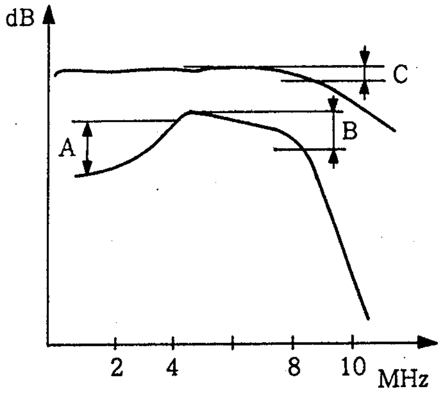
Step-1
TP107/MDM-5P (B-5)
Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2
TP107/MDM-5P (B-5)
Picture of the network analyzer via oscilloscope



A (Deley time between 2 MHz to 4 MHz) : +60 ns ± 10 ns
B (Deley time between 4 MHz tò 8 MHz) : -20 ns ± 10 ns
C (Gain difference between 2 MHz to 8 MHz) : 3 dB or less

Adjustment: RV21/MDM-5P (B-6)
RV22/MDM-5P (B-6)

TRIG: INT

NOTE: After adjustment is completed, disconnect the plug from COR102/MDM-5P board, and connect the plug to COR101/MDM-5P board.

10-2-23. C RF Phase Equalizer Adjustment (Metal)

Preparations for adjustment

- .Connect a network analyzer to OUTPUT terminal of an oscilloscope.
- .Connect the OUTPUT terminal of the network analyzer to TP504/MDM-5P board (F-7).
- .Disconnect a plug from COR501/MDM-5P board (F-7), and connect the plug to COR502/MDM-5P board (F-7).
- .Insert a blank tape BCT-20M (METAL).
- .Perform the calibration.
- .EE mode

Specifications and adjustment

Step-1

TP507/MDM-5P (F-5)

Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

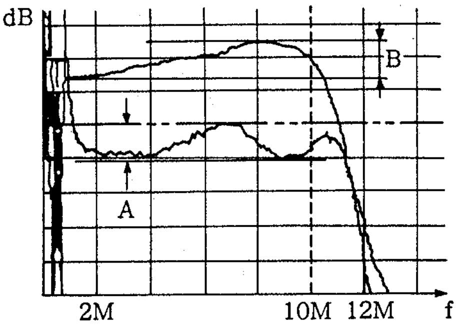
Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2

TP507/MDM-5P (F-7)

Picture of the network analyzer via oscilloscope



A (Deley time between 1 MHz to 10 MHz) : 20 ns or less
B (Gain difference between 1 MHz to 10 MHz) : 3 dB or less

Adjustment: RV51/MDM-5P (E-6)
RV52/MDM-5P (E-6)

TRIG: INT

NOTE: After adjustment is completed, disconnect the plug from COR502/MDM-5P board, and connect the plug to COR501/MDM-5P board.

10-2-24. C RF Phase Equalizer Adjustment (Oxide)

Preparations for adjustment

.Connect a network analyzer to OUTPUT terminal of an oscilloscope.
.Connect the OUTPUT terminal of the network analyzer to TP504/MDM-5P board (F-7).
.Disconnect a plug from COR501/MDM-5P board (F-7), and connect the plug to COR502/MDM-5P board (F-7).
.Insert a blank tape BCT-20G (OXIDE).
.Perform the caliblation.
.EE mode

Specifications and adjustment

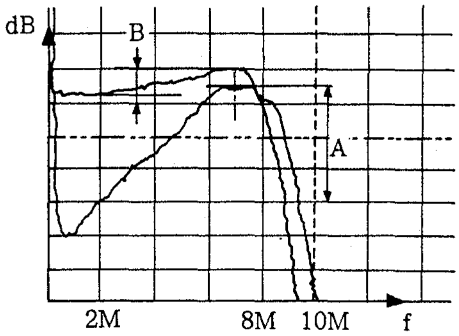
Step-1
TP507/MDM-5P (F-5)
Waveform of the oscilloscope

Level = 200 ± 40 mVp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2
TP507/MDM-5P (F-7)
Picture of the network analyzer



A (Deley time between 2 MHz to 7 MHz) : 70 ± 20 ns
Deley time around 3.5 MHz should be straighten (at linear scale).
B (Gain difference between 2 MHz to 7 MHz) : 3 dB or less

Adjustment: RV71/MDM-5P (E-6)
RV72/MDM-5P (E-6)

TRIG: INT

NOTE: After adjustment is completed, disconnect the plug from COR502/MDM-5P board, and connect the plug to COR501/MDM-5P board.

10-2-25. RP A-ch Cos. Equalizer Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 005, ITEM 013, ITEM 007, ITEM 015)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Connect a network analyzer to OUTPUT terminal of an oscilloscope.
.Connect a head coupling tool to the OUTPUT terminal of the network analyzer.
.Set DT SELECT switch to OFF.
.Insert a cassette without tape BCT-20M (METAL).
.EE mode
.Attach the head coupling tool to RP A-ch head of the drum.

Preparations for adjustment

Step-1 to Step-3
.Short between TP902/MDM-5P (K-3) and GND with a shorting clip lead.

Specifications and adjustment

Step-1
TP107/MDM-5P (B-5)
Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2
TP107/MDM-5P (B-5)
Picture of the network analyzer

Level difference between 8.1 MHz to 4.0 MHz = -0.5 ± 0.3 dB
(Reference level is 8.1 MHz.)

Adjustment:
(Y RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 005 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-3

TP111/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 8.1 MHz to 4.0 MHz = -9.2 ± 0.3 dB
(Reference level is 8.1 MHz.)

Adjustment:
(Y RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 013 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

NOTE: After adjustments are completed, remove a shorting clip lead.

Preparations for adjustment

Step-4 to Step-6

. Short between TP903/MDM-5P (K-3) and GND with a shorting clip lead.

Specifications and adjustment

Step-4

TP507/MDM-5P (F-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-5

TP507/MDM-5P (F-5)

Picture of the network analyzer

Level difference between 6.1 MHz to 4.0 MHz = -0.6 ± 0.3 dB
(Reference level is 6.1 MHz.)

Adjustment:
(C RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 007 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-6

TP511/MDM-5P (F-4)

Picture of the network analyzer

Level difference between 6.1 MHz to 4.0 MHz = -4.4 ± 0.3 dB
(Reference level is 6.1 MHz.)

Adjustment:
(C RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec.
according to the ITEM 015 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: INT

NOTE: After adjustments are completed, remove a shorting clip lead.

10-2-26. RP A-ch Cos. Equalizer Adjustment (Oxide)
(VIDEO ADJUST MENU: ITEM 005, ITEM 013, ITEM 007, ITEM 015)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Connect a network analyzer to OUTPUT terminal of an oscilloscope.
.Connect a head coupling tool to the OUTPUT terminal of the network analyzer.
.Set DT SELECT switch to OFF.
.Insert a cassette without tape BCT-20G (OXIDE).
.EE mode
.Attach the head coupling tool to RP A-ch head of the drum.

Preparations for adjustment

Step-1 top Step-3

.Short between TP902/MDM-5P (K-3) and GND with a shorting clip lead.

Specifications and adjustment

Step-1

TP107/MDM-5P (B-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment
Step-2
TP107/MDM-5P (B-5)
Picture of the network analyzer

Level difference between 5.7 MHz to 3.0 MHz = -1.5 ± 0.2 dB
(Reference level is 5.7 MHz.)

Adjustment:
(Y RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 005 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment
Step-3
TP111/MDM-5P (B-5)
Picture of the network analyzer

Level difference between 5.7 MHz to 3.0 MHz = -10.0 ± 0.1 dB
(Reference level is 5.7 MHz.)

Adjustment:
(Y RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 013 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

NOTE: After adjustments are completed, remove a shorting clip lead.

Preparations for adjustment
Step-4 to Step-6
. Short between TP903/MDM-5P (K-3) and GND with a shorting clip lead.

Specifications and adjustment
Step-4
TP507/MDM-5P (F-5)
Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-5

TP507/MDM-5P (F-5)

Picture of the network analyzer

Level difference between 4.5 MHz to 3.0 MHz = -1.1 ± 0.2 dB
(Reference level is 4.5 MHz.)

Adjustment:
(C RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 007 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-6

TP511/MDM-5P (F-4)

Picture of the network analyzer

Level difference between 4.5 MHz to 3.0 MHz = -4.8 ± 0.2 dB
(Reference level is 4.5 MHz.)

Adjustment:
(C RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 015 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: INT

NOTE: After adjustments are completed, remove a shorting clip lead.

10-2-27. RP B-ch Cos. Equalizer Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 006, ITEM 014, ITEM 008, ITEM 016)

.Refer to “VIDEO ADJUST of the maintenance menu” in the headed portion of Section 10.

Preparations for adjustment

.Connect a network analyzer to OUTPUT terminal of an oscilloscope.
.Connect a head coupling tool to the OUTPUT terminal of the network analyzer.
.Set DT SELECT switch to OFF.
.Insert a cassette without tape BCT-20M (METAL).
.EE mode
.Attach the head coupling tool to RP B-ch head of the drum.

Preparations for adjustment

Step-1 to Step-3
.Short between TP902/MDM-5P (K-3) and L801(+5 V) (J-3) with a shorting clip lead.

Specifications and adjustment

Step-1
TP107/MDM-5P (B-5)
Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2
TP107/MDM-5P (B-5)
Picture of the network analyzer

Level difference between 8.1 MHz to 4.0 MHz = -0.5 ± 0.3 dB
(Reference level is 8.1 MHz.)

Adjustment:
(Y RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 006 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-3

TP111/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 8.1 MHz to 4.0 MHz = -9.2 ± 0.3 dB
(Reference level is 8.1 MHz.)

Adjustment:
(Y RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec.
according to the ITEM 014 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

NOTE: After adjustments are completed, remove a shorting clip lead.

Preparations for adjustment

Step-4 to Step-6

. Short between TP903/MDM-5P (K-3) and L801 (+5 V) (J-3) with a shorting clip lead.

Specifications and adjustment

Step-4

TP507/MDM-5P (F-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-5

TP507/MDM-5P (F-5)

Picture of the network analyzer

Level difference between 6.1 MHz to 4.0 MHz = -0.6 ± 0.3 dB
(Reference level is 6.1 MHz.)

Adjustments:
(C RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec.
according to the ITEM 008 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-6

TP511/MDM-5P (F-4)

Picture of the network analyzer

Level difference between 6.1 MHz to 4.0 MHz = -4.4 ± 0.3 dB
(Reference level is 6.1 MHz.)

Adjustments:
(C RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 016 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: INT

NOTE: After adjustments are completed, remove a shorting clip lead.

10-2-28. RP B-ch Cos. Equalizer Adjustment (Oxide)

(VIDEO ADJUST MENU: ITEM 006, ITEM 014, ITEM 008, ITEM 016)

.Refer to “VIDEO ADJUST of the maintenance menu” in the headed portion of Section 10.

Preparations for adjustment

.Connect a network analyzer to OUTPUT terminal of an oscilloscope.
.Connect a head coupling tool to the OUTPUT terminal of the network analyzer.
.Set DT SELECT switch to OFF.
.Insert a cassette without tape BCT-20G (OXIDE).
.EE mode
.Attach the head coupling tool to RP B-ch head of the drum.

Preparations for adjustment

Step-1 to Step-3

.Short between TP902/MDM-5P (K-3) and L801 (+5 V) (J-3) with a shorting clip lead.

Specifications and adjustment

Step-1

TP107/MDM-5P (B-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustments: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2

TP107/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 5.7 MHz to 3.0 MHz = -1.5 ± 0.2 dB
(Reference level is 5.7 MHz.)

Adjustments:
(Y RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 006 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-3

TP111/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 5.7 MHz to 3.0 MHz = -10.0 ± 0.1 dB
(Reference level is 5.7 MHz.)

Adjustment:
(Y RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 014 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

NOTE: After adjustments are completed, remove a shorting clip lead.

Preparations for adjustment

Step-4 to Step-6

. Short between TP903/MDM-5P (K-3) and L801 (+5 V) (J-3) with a shorting clip lead.

Specifications and adjustment

Step-4

TP507/MDM-5P (F-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-5

TP507/MDM-5P (F-5)

Picture of the network analyzer

Level difference between 4.5 MHz to 3.0 MHz = -1.1 ± 0.2 dB
(Reference level is 4.5 MHz.)

Adjustment:
(C RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 008 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-6

TP511/MDM-5P (F-4)

Picture of the network analyzer

Level difference between 4.5 MHz to 3.0 MHz = -4.8 ± 0.2 dB
(Reference level is 4.5 MHz.)

Adjustments:
(C RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 016 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: INT

NOTE: After adjustments are completed, remove a shorting clip lead.

10-2-29. DT A-ch Cos. Equalizer Adjustment (Metal)

(VIDEO ADJUST MENU: ITEM 005, ITEM 013, ITEM 007, ITEM 015)

. Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

. Connect a network analyzer to OUTPUT terminal of an oscilloscope.
. Connect a head coupling tool to the OUTPUT terminal of the network analyzer.
. Set DT SELECT switch to VAR.
. Insert a cassette without tape BCT-20M (METAL).
. EE mode
. Attach the head coupling tool to DT A-ch head of the drum.

Preparations for adjustment

Step-1 to Step-3
. Short between TP902/MDM-5P (K-3) and GND with a shorting clip lead.

Specifications and adjustment

Step-1
TP107/MDM-5P (B-5)
Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustments: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2
TP107/MDM-5P (B-5)
Picture of the network analyzer

Level difference between 8.1 MHz to 4.0 MHz = 0 ± 0.3 dB
(Reference level is 8.1 MHz.)

Adjustment:
(Y RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 005 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-3

TP111/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 8.1 MHz to 4.0 MHz = -9.8 ± 0.3 dB
(Reference level is 8.1 MHz.)

Adjustment:
(Y RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 013 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

NOTE: After adjustments are completed, remove a shorting clip lead.

Preparations for adjustment

Step-4 to Step-6

. Short between TP903/MDM-5P (K-3) and GND with a shorting clip lead.

Specifications and adjustment

Step-4

TP507/MDM-5P (F-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-5

TP507/MDM-5P (F-5)

Picture of the network analyzer

Level difference between 6.1 MHz to 4.0 MHz = +0.1 ± 0.3 dB
(Reference level is 6.1 MHz.)

Adjustment:
(C RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 007 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-6

TP511/MDM-5P (F-4)

Picture of the network analyzer

Level difference between 6.1 MHz to 4.0 MHz = -4.1 ± 0.3 dB
(Reference level is 6.1 MHz.)

Adjustment:
(C RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 015 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: INT

NOTE: After adjustments are completed, remove a shorting clip lead.

10-2-30. DT A-ch Cos. Equalizer Adjustment (Oxide)

(VIDEO ADJUST MENU: ITEM 005, ITEM 013, ITEM 007, ITEM 015)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Connect a network analyzer to OUTPUT terminal of an oscilloscope.
.Connect a head coupling tool to the OUTPUT terminal of the network analyzer.
.Set DT SELECT switch to VAR.
.Insert a cassette without tape BCT-20G (OXIDE).
.EE mode
.Attach the head coupling tool to DT A-ch head of the drum.

Preparations for adjustment

Step-1 to Step-3

.Short between TP902/MDM-5P (K-3) and GND with a shorting clip lead.

Specifications and adjustment

Step-1

TP107/MDM-5P (B-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2

TP107/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 5.7 MHz to 3.0 MHz = +0.5 ± 0.2 dB
(Reference level is 5.7 MHz.)

Adjustment:
(Y RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 005 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-3

TP111/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 5.7 MHz to 3.0 MHz = -9.5 ± 0.2 dB
(Reference level is 5.7 MHz.)

Adjustment:
(Y RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 013 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

NOTE: After adjustments are completed, remove a shorting clip lead.

Preparations for adjustment

Step-4 to Step-6

.Short between TP903/MDM-5P (K-3) and GND with a shorting clip lead.

Specifications and adjustment

Step-4

TP507/MDM-5P (F-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-5

TP507/MDM-5P (F-5)

Picture of the network analyzer

Level difference between 4.5 MHz to 3.0 MHz = -1.1 ± 0.2 dB
(Reference level is 4.5 MHz.)

Adjustment:
(C RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec.
according to the ITEM 007 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-6

TP511/MDM-5P (F-4)

Picture of the network analyzer

Level difference between 4.5 MHz to 3.0 MHz = -4.8 ± 0.2 dB
(Reference level is 4.5 MHz.)

Adjustment:
(C RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec.
according to the ITEM 015 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: INT

NOTE: After adjustments are completed, remove a shorting clip lead.

10-2-31. DT B-ch Cos. Equalizer Adjustment (Metal)

(VIDEO ADJUST MENU: ITEM 006, ITEM 014, ITEM 008, ITEM 016)

. Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

- . Connect a network analyzer to OUTPUT terminal of an oscilloscope.
- . Connect a head coupling tool to the OUTPUT terminal of the network analyzer.
- . Set DT SELECT switch to VAR.
- . Insert a cassette without tape BCT-20M (METAL).
- . EE mode.
- . Attach the head coupling tool to DT B-ch head of the drum.

Preparations for adjustment

Step-1 to Step-3

. Short between TP902/MDM-5P (K-3) and L801 (+5 V) (J-3) with a shorting clip lead.

Specifications and adjustment

Step-1

TP107/MDM-5P (B-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2

TP107/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 8.1 MHz to 4.0 MHz = 0 ± 0.3 dB
(Reference level is 8.1 MHz.)

Adjustment:
(Y RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 006 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-3

TP111/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 8.1 MHz to 4.0 MHz = -9.8 ± 0.3 dB
(Reference level is 8.1 MHz.)

Adjustment:
(Y RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 014 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

NOTE: After adjustments are completed, remove a shorting clip lead.

Preparations for adjustment

Step-4 to Step-6

.Short between TP903/MDM-5P (K-3) and L801 (+5 V) (J-3) with a shorting clip lead.

Specifications and adjustment

Step-4

TP507/MDM-5P (F-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-5

TP507/MDM-5P (F-5)

Picture of the network analyzer

Level difference between 6.1 MHz to 4.0 MHz = +0.1 ± 0.3 dB
(Reference level is 6.1 MHz.)

Adjustment:
(C RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 008 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-6

TP511/MDM-5P (F-4)

Picture of the network analyzer

Level difference between 6.1 MHz to 4.0 MHz = -4.1 ± 0.3 dB
(Reference level is 6.1 MHz.)

Adjustment:
(C RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 016 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: INT

NOTE: After adjustments are completed, remove a shorting clip lead.

10-2-32. DT B-ch Cos. Equalizer Adjustment (Oxide)

(VIDEO ADJUST MENU: ITEM 006, ITEM 014, ITEM 008, ITEM 016)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Connect a network analyzer to OUTPUT terminal of an oscilloscope.
.Connect a head coupling tool to the OUTPUT terminal of the network analyzer.
.Set DT SELECT switch to VAR.
.Insert a cassette without tape BCT-20G (OXIDE).
.EE mode
.Attach the head coupling tool to DT B-ch head of the drum.

Preparations for adjustment

Step-1 to Step-3

.Short between TP902/MDM-5P (K-3) and L801 (+5 V) (J-3) with a shorting clip lead.

Specifications and adjustment

Step-1

TP107/MDM-5P (B-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-2

TP107/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 5.7 MHz to 3.0 MHz = +0.5 ± 0.2 dB
(Reference level is 5.7 MHz.)

Adjustment:
(Y RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 006 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-3

TP111/MDM-5P (B-5)

Picture of the network analyzer

Level difference between 5.7 MHz to 3.0 MHz = -9.5 ± 0.2 dB
(Reference level is 5.7 MHz.)

Adjustment:
(Y RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 014 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

NOTE: After adjustments are completed, remove a shorting clip lead.

Preparations for adjustment

Step-4 to Step-6

. Short between TP903/MDM-5P (K-3) and L801 (+5 V) (J-3) with a shorting clip lead.

Specifications and adjustment

Step-4

TP507/MDM-5P (F-5)

Waveform of the oscilloscope

Level = 1.2 ± 0.2 Vp-p

Adjustment: OUTPUT control/Network analyzer

Specifications and adjustment

Step-5

TP507/MDM-5P (F-5)

Picture of the network analyzer

Level difference between 4.5 MHz to 3.0 MHz = -1.1 ± 0.2 dB
(Reference level is 4.5 MHz.)

Adjustment:
(C RF COS. EQ. 1 ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 008 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Specifications and adjustment

Step-6

TP511/MDM-5P (F-4)

Picture of the network analyzer

Level difference between 4.5 MHz to 3.0 MHz = -4.8 ± 0.2 dB
(Reference level is 4.5 MHz.)

Adjustment:
(C RF COS. EQ. 2 SUB ADJUST)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 016 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: INT

NOTE: After adjustments are completed, remove a shorting clip lead.

10-2-33. Y RF Output Level Tentative Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 001 and ITEM 002)

. Refer to "VIDEO ADJUST of the maintenence menu" in the head portion of Section 10.

Preparations for adjustment

. Playback the 50% flat field signal portion (24:00 to 26:00) of an alignment tape CR5-1B PS.

Preparations for adjustment

Step-1

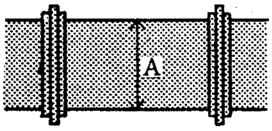
. Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

TP110/MDM-5P (B-5)

Waveform of the oscilloscope



A = 200 ± 20 mVp-p

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 001 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 002 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

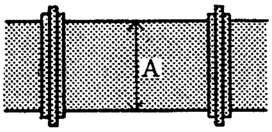
. Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

TP110/MDM-5P (B-5)

Waveform of the oscilloscope



A = 200 ± 20 mVp-p

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 001 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 002 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: TP902/MDM-5P (K-3)

10-2-34. Y RF Output Level Tentative Adjustment (Oxide)
(VIDEO ADJUST MENU: ITEM 001 and ITEM 002)

.Refer to "VIDEO ADJUST of the maintenence menu" in the head portion of Section 10.

Preparations for adjustment

.Playback the color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.

Preparations for adjustment

Step-1

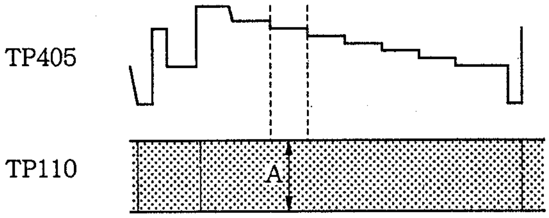
.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

TP110/MDM-5P (B-5)
TP405/MDM-5P (D-1)
Waveform of the oscilloscope

A = 200 ± 20 mVp-p



Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 001 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 002 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

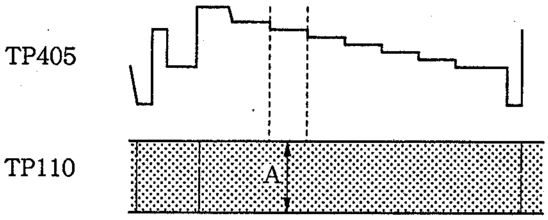
.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

TP110/MDM-5P (B-5)
TP405/MDM-5P (D-1)
Waveform of the oscilloscope

A = 200 ± 20 mVp-p



Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 001 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 002 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: TP902/MDM-5 (K-3)

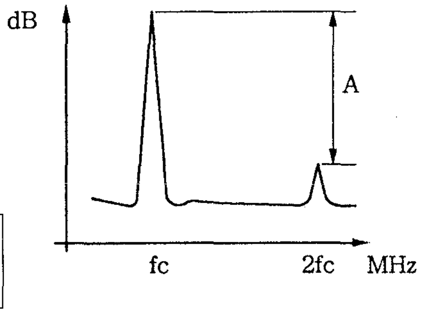
10-2-35. Y OMC Carrier Balance Adjustment

Preparations for adjustment

- .Connect a spectrum analyzer to OUTPUT terminal of an oscilloscope.
- .Playback the 50% flat field signal portion (24:00 to 26:00) of an alignment tape CR5-1B PS.
- .Set DT SELECT switch to VAR.

Specifications and adjustment

TP302/MDM-5P (C-4)
Picture of the spectrum analyzer



Minimize 2fc portion of the waveform.
A: more than 40 dB

Adjustment: RV301/MDM-5P (B-3)

TRIG: TP302/MDM-5P (C-4)

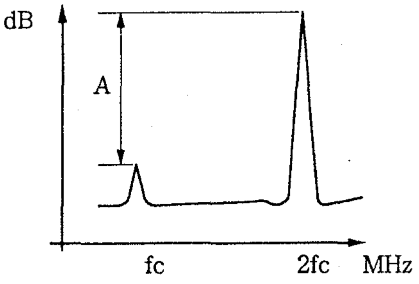
10-2-36. Y Demodulater Limiter Balance Adjustment

Preparations for adjustment

- .Connect a spectrum analyzer to OUTPUT terminal of an oscilloscope.
- .Playback the 50% flat field signal portion (24:00 to 26:00) of an alignment tape CR5-1B PS.
- .Set DT SELECT switch to VAR.

Specifications and adjustment

TP401/MDM-5P (C-3)
Picture of the spectrum analyzer



Minimize fc portion of the waveform.
A: more than 40 dB

Adjustment: RV401/MDM-5P (C-4)

TRIG: TP401/MDM-5P (C-3)

10-2-37. C RF Output Level Tentative Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 003 and ITEM 004)

. Refer to "VIDEO ADJUST of the maintenence menu" in the head portion of Section 10.

Preparations for adjustment

. Playback the 50% flat field signal portion (24:00 to 26:00) of an alignment tape CR5-1B PS.

Preparations for adjustment

Step-1

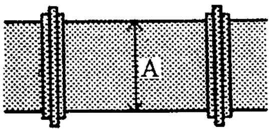
. Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

TP510/MDM-5P (F-7)

Waveform of the oscilloscope



A = 200 ± 20 mVp-p

Adjustment:

(Ach)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 003 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

(Bch)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 004 of the maintenance menu.

After spec. is met,. press S304 on SS-48DP board.

Preparations for adjustment

Step-2

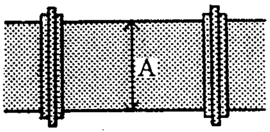
. Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

TP510/MDM-5P (F-7)

Waveform of the oscilloscope



A = 200 ± 20 mVp-p

Adjustment:

(Ach)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 003 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

(Bch)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 004 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

TRIG: TP903/MDM-5P (K-3)

10-2-38. C RF Output Level Tentative Adjustment (Oxide)
(VIDEO ADJUST MENU: ITEM 003 and ITEM 004)

.Refer to "VIDEO ADJUST of the maintenence menu" in the head portion of Section 10.

Preparations for adjustment

.Playback the color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.

Preparations for adjustment

Step-1

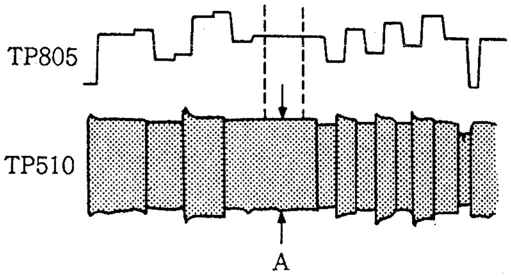
.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

TP510/MDM-5P (F-7)
TP805/MDM-5P (J-1)
Waveform of the oscilloscope

A = 200 ± 20 mVp-p



Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 003 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 004 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

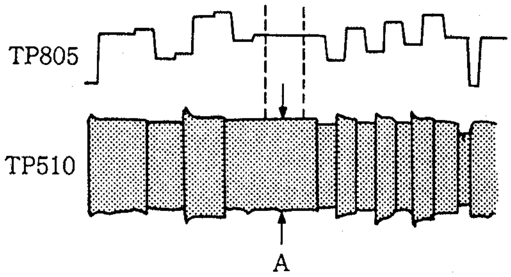
.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

TP510/MDM-5P (F-7)
TP805/MDM-5P (J-1)
Waveform of the oscilloscope

A = 200 ± 20 mVp-p



Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 003 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 004 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: TP903/MDM-5P (K-3)

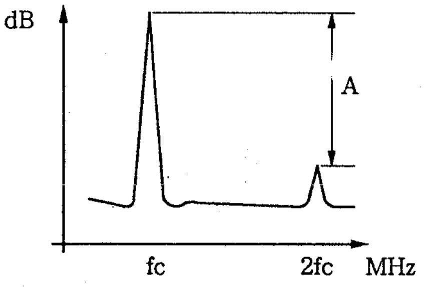
10-2-39. C OMC Carrier Balance Adjustment

Preparations for adjustment

- .Connect a spectrum analyzer to OUTPUT terminal of an oscilloscope.
- .Playback the 50% flat field signal portion (24:00 to 26:00) of an alignment tape CR5-1B PS.
- .Set DT SELECT switch to VAR.

Specifications and adjustment

TP702/MDM-5P (G-4)
Picture of the spectrum analyzer



Minimize 2fc portion of the waveform. A: more than 40 dB

Adjustment: RV701/MDM-5P (F-3)

TRIG: TP702/MDM-5P (G-4)

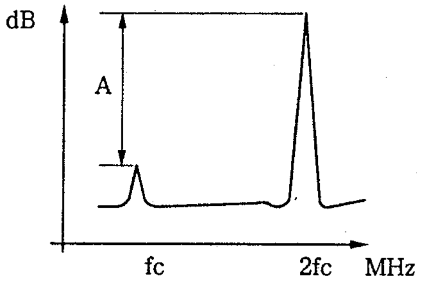
10-2-40. C Demodulater Limiter Balance Adjustment

Preparations for adjustment

- .Connect a spectrum analyzer to OUTPUT terminal of an oscilloscope.
- .Playback the 50% flat field signal portion (24:00 to 26:00) of an alignment tape CR5-1B PS.
- .Set DT SELECT switch to VAR.

Specifications and adjustment

TP801/MDM-5P (H-4)
Picture of the spectrum analyzer



Minimize fc portion of the waveform. A: more than 40 dB

Adjustment: RV801/MDM-5P (G-4)

TRIG: TP801/MDM-5P (H-4)

10-2-41. RF Phase Equalizer Adjustment (Oxide)

Preparations for adjustment

- .Playback the color-bar signal portion of an alignment tape CR5-2A PS.
- .Put the unit into STILL mode.
- .Turn the search dial so that the guard band noise is placed to the center of the monitor screen.

Specifications and adjustment

Step-1
monitor TV

The width of the guard band is within 1/5 to 1/4 of the monitor screen.

Adjustment: RV266/MDM-5P (C-7)

Specifications and adjustment

Step-2
monitor TV

The overmodulation at the upper portion and lower portion of the guard band noise makes mimimum.

Adjustment: RV21/MDM-5P (B-6)

10-2-42. Y OMC Adjustment (Metal)

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP303/MDM-5P (B-3) or IC301-3pin/MDM-5P (A-3)
Waveform of the oscilloscope

4.4 ± 0.1 Vdc

Adjustment: RV303/MDM-5P (A-3)

TRIG: TP303/MDM-5P (B-3)

10-2-43. Y OMC Adjustment (Oxide)

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

TP303/MDM-5P (B-3) or IC301-3pin/MDM-5P (A-3)
Waveform of the oscilloscope

4.0 ± 0.1 Vdc

Adjustment: RV304/MDM-5P (A-4)

TRIG: TP303/MDM-5P (B-3)

10-2-44. C OMC Adjustment (Metal)

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

TP703/MDM-5P (G-4) or IC701-3pin/MDM-5P (A-3)
Waveform of the oscilloscope

4.0 ± 0.1 Vdc

Adjustment: RV703/MDM-5P (F-4)

TRIG: TP703/MDM-5P (F-4)

10-2-45. C OMC Adjustment (Oxide)

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

TP703/MDM-5P (G-4) or IC701-3pin/MDM-5P (A-3)
Waveform of the oscilloscope

4.0 ± 0.1 Vdc

Adjustment: RV704/MDM-5P (F-4)

TRIG: TP703/MDM-5P (G-4)

10-2-46. Y Non-linear De-emphasis Output Level Adjustment

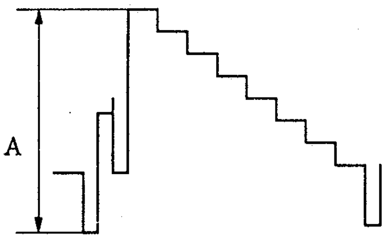
Preparations for adjustment

Step-1

- .Play back the color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.
- .Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1
TP404/MDM-5P (C-1)
Waveform of the oscilloscope



A = 1.00 ± 0.01 Vp-p

Adjustment: RV411/MDM-5P (B-1)

Preparations for adjustment

Step-2

- .Play back the color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.
- .Set DT SELECT switch to OFF.

Specifications and adjustment

Step-2

TP404/MDM-5P (C-1)

Waveform of the oscilloscope

A = 1.00 ± 0.01 Vp-p

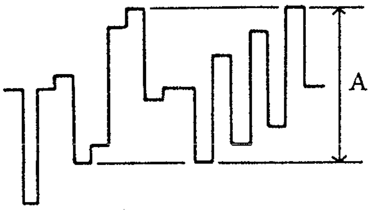
Adjustment: RV412/MDM-5P (C-1)

TRIG: TP404/MDM-5P (C-1)

10-2-47. C Non-linear De-emphasis Output Level Adjustment

Preparations for adjustment
Step-1
- .Play back the color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.
- .Set DT SELECT switch to OFF.

Specifications and adjustment
Step-1
TP804/MDM-5P (H-2)
Waveform of the oscilloscope



A = 933 ± 10 mVp-p

Adjustment: RV811/MDM-5P (J-1)

Preparations for adjustment
Step-2
- .Play back the color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.

Specifications and adjustment
Step-2
TP804/MDM-5P (H-2)
Waveform of the oscilloscope

A = 700 ± 10 mVp-p

Adjustment: RV812/MDM-5P (H-1)

TRIG: TP804/MDM-5P (H-2)

10-2-48. Y PB Video Frequency Response Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 009 and ITEM 010)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Play back the 60% multi burst signal portion (8:00 to 11:00) of an alignment tape CR5-1B PS.

Preparations for adjustment

Step-1

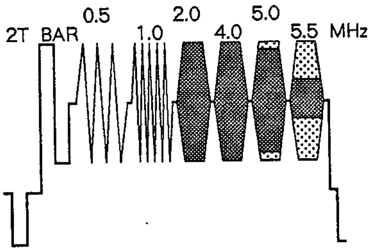
.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

Y OUT/ D/A convertor box.

Waveform of the waveform monitor



2T BAR : reference 100% (0 dB)
0.5 MHz: 0 +0.3/-0.4 dB
1.0 MHz: 0 +0.3/-0.4 dB
2.0 MHz: 0 ± 0.3 dB
4.0 MHz: 0 +0.3/-0.4 dB
5.0 MHz: 0 +0.3/-0.8 dB
5.5 MHz: -1.5 +1.3/-0.8 dB

The level deference between Ach and Bch is less than 0.5 dB (0.5 MHz to 5 MHz).

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 009 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 010 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

Y OUT/ D/A convertor box.

Waveform of the waveform monitor

The specifications are the same as step-1.

Adjustment:

(Ach)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 009 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

(Bch)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 010 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

10-2-49. Y PB Video Frequency Response Adjustment (Oxide)
(VIDEO ADJUST MENU: ITEM 009 and ITEM 010)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Play back the 60% multi burst signal portion (3:00 to 6:00) of an alignment tape CR5-2A PS.

Preparations for adjustment

Step-1

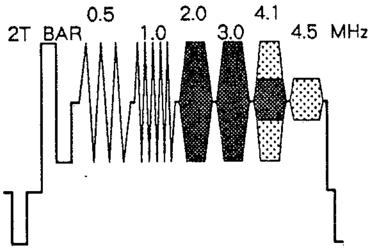
.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

Y OUT/ D/A convertor box.

Waveform of the waveform monitor



2T BAR : reference 100% (0 dB)
0.5 MHz: 0 ± 0.3 dB
1.0 MHz: 0 ± 0.3 dB
2.0 MHz: 0 +0.3/-0.5 dB
3.0 MHz: -1.0 ± 1.0 dB
4.1 MHz: -3.0 ± 2.3 dB

The level deference between Ach and Bch is less than 0.5 dB (0.5 MHz to 3 MHz).

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 009 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 010 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

Y OUT/ D/A convertor box.

Waveform of the waveform monitor

The specifications are the same as step-1.

Adjustment:

(Ach)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 009 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

(Bch)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 010 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

10-2-50. Y RF Output Level Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 001 and ITEM 002)

. Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

. Play back the 50% flat field signal portion (24:00 to 26:00) of an alignment tape CR5-1B PS.

Preparations for adjustment

Step-1

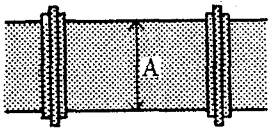
. Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

TP110/MDM-5P (B-5)

Waveform of the oscilloscope



A = 200 ± 20 mVp-p

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 001 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 002 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

. Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

TP110/MDM-5P (C-5)

Waveform of the oscilloscope

A = 200 ± 20 mVp-p

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 001 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 002 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

(continued on next page)

TRIG: TP902/MDM-5P (K-3)

NOTE: After adjustments are completed, perform confirmation Section 10-2-48. Y PB video frequency response adjustment (metal).

10-2-51. Y RF Output Level Adjustment (Oxide)
(VIDEO ADJUST MENU: ITEM 001 and ITEM 002)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Play back the color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.

Preparations for adjustment

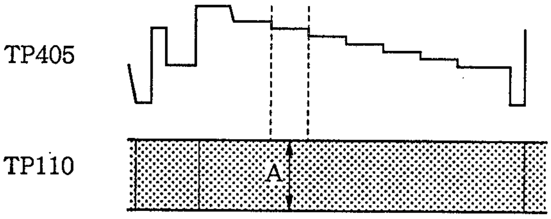
Step-1

.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

TP110/MDM-5P (B-5)
TP405/MDM-5P (D-1)
Waveform of the oscilloscope



A = 200 ± 20 mVp-p

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 001 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 002 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

. Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

TP110/MDM-5P (B-5)

Waveform of the oscilloscope

A = 200 ± 20 mVp-p

Adjustment:

(Ach)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 001 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

(Bch)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 002 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

TRIG: TP902/MDM-5P (K-3)

NOTE: After adjustments are completed, perform confirmation Section 10-2-49. Y PB video frequency response adjustment (oxide).

10-2-52. C PB Video Frequency Response Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 011 and ITEM 012)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Play back the multi burst signal portion (8:00 to 11:00) of an alignment tape CR5-1B PS.

Preparations for adjustment

Step-1

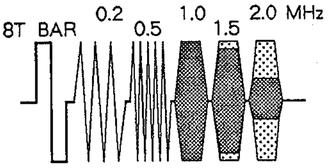
.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

R-Y OUT/ D/A convertor box.

Waveform of the waveform monitor



8T BAR : reference 100% (0 dB)
0.2 MHz: 0 ± 0.3 dB
0.5 MHz: 0 ± 0.3 dB
1.0 MHz: 0 +0.4/- 0.3 dB
1.5 MHz: -0.4 +0.3/-0.4 dB
2.0 MHz: -2.0 +1.5/-0.8 dB

The level deference between Ach and Bch is less than 0.5 dB (0.2 MHz to 1.5 MHz).

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 011 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 012 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-2

B-Y OUT/ D/A convertor box.

Waveform of the waveform monitor

The specifications are the same as Step-1.

Adjustment: Confirm the frequency response of B-Y OUT to meet the specifications.

Preparations for adjustment

Step-3

.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-3

R-Y OUT/ D/A convertor box.

Waveform of the waveform monitor

The specifications are the same as step-1.

Adjustment:

(Ach)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 011 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

(Bch)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 012 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-4

.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-4

B-Y OUT/ D/A convertor box.

Waveform of the waveform monitor

The specifications are the same as Step-1.

Adjustment: Confirm the frequency response of B-Y OUT to meet the specifications.

10-2-53. C PB Video Frequency Response Adjustment (Oxide)

(VIDEO ADJUST MENU: ITEM 011 and ITEM 012)

.Refer to “VIDEO ADJUST of the maintenance menu” in the headed portion of Section 10.

Preparations for adjustment

.Play back the 60% multi burst signal portion (3:00 to 6:00) of an alignment tape CR5-2A PS.

Preparations for adjustment

Step-1

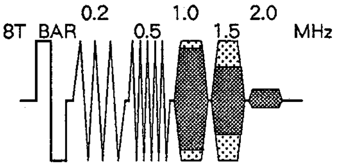
.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

R-Y OUT/ D/A convertor box.

Waveform of the waveform monitor



8T BAR : reference 100% (0 dB)
0.2 MHz: 0 ± 0.3 dB
0.5 MHz: 0 ± 0.3 dB
1.0 MHz: -0.5 ± 0.8 dB
1.5 MHz: -1.2 +1.2/-1.3 dB
2.0 MHz: -----

The level deference between Ach and Bch is less than 0.5 dB (0.2 MHz to 1 MHz).

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 011 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 012 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-2

B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

The specifications are the same as Step-1.

Adjustments: Confirm the frequency response of B-Y OUT to meet the specifications.

Preparations for adjustment

Step-3

.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-3

R-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

The specifications are the same as step-1.

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 011 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 012 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-4

.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-4

B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

The specifications are the same as Step-1.

Adjustment: Confirm the frequency response of B-Y OUT to meet the specifications.

10-2-54. C RF Output Level Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 003 and ITEM 004)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Play back the 50% flat field signal portion (24:00 to 26:00) of an alignment tape CR5-1B PS.

Preparations for adjustment

Step-1

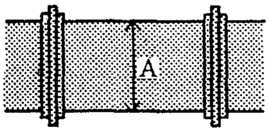
.Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

TP510/MDM-5P (F-4)

Waveform of the oscilloscope



A = 200 ± 20 mVp-p

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 003 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 004 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

TP510/MDM-5P (F-4)

Waveform of the oscilloscope

A = 200 ± 20 mVp-p

Adjustment:

(Ach)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 003 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

(Bch)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 004 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

TRIG: TP903/MDM-5P (K-3)

NOTE: After adjustments are completed, perform confirmation Section 10-2-52. C PB video frequency response adjustment (metal).

10-2-55. C RF Output Level Adjustment (Oxide)

(VIDEO ADJUST MENU: ITEM 003 and ITEM 004)

. Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

. Play back the color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.

Preparations for adjustment

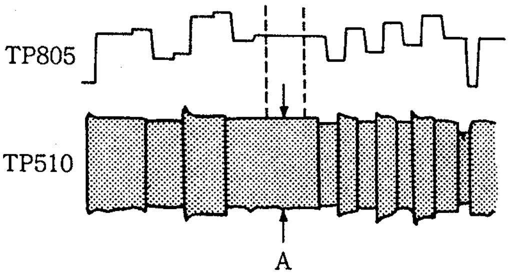
Step-1

. Set DT SELECT switch to OFF.

Specifications and adjustment

Step-1

TP510/MDM-5P (F-7)
TP805/MDM-5P (J-1)
Waveform of the oscilloscope



A = 200 ± 20 mVp-p

Adjustment:
(Ach)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 003 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.
(Bch)
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 004 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

Preparations for adjustment

Step-2

.Set DT SELECT switch to VAR.

Specifications and adjustment

Step-2

TP510/MDM-5P (F-7)

Waveform of the oscilloscope

A = 200 ± 20 mVp-p

Adjustment:

(Ach)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 003 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

(Bch)

While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 004 of the maintenance menu.

After spec. is met, press S304 on SS-48DP board.

TRIG: TP903/MDM-5P (K-3)

NOTE: After adjustments are completed, perform confirmation Section 10-2-53.
C PB video frequency response adjustment (oxide).

10-2-56. Y DOC Equalizer Adjustment

Preparations for adjustment

Step-1

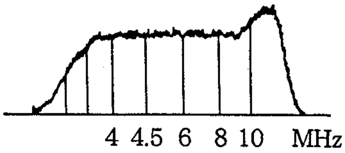
- .Set DT SELECT switch to OFF.
- .Play back the RF sweep signal portion (0:00 to 2:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-1 (Metal RP Head)

TP253/MDM-5P (D-7)

Waveform of the oscilloscope



4.0 MHz: reference 100%
4.5 MHz: ---
6.0 MHz: 100 ± 20%
8.0 MHz: 100 ± 20%
10 MHz: 120 +40/-20%
12 MHz: ---

Adjustment: (Metal RP Head Adjustment)
RV251/MDM-5P (B-5)

Preparations for adjustment

Step-2

- .Set DT SELECT switch to VAR.
- .Play back the RF sweep signal portion (0:00 to 2:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-2 (Metal DT Head)

TP253/MDM-5P (D-7)

Waveform of the oscilloscope

4.0 MHz: reference 100%
4.5 MHz: ---
6.0 MHz: 100 ± 20%
8.0 MHz: 110 ± 30%
10 MHz: 110 +50/-30%
12 MHz: ---

Adjustment: (Metal DT Head Adjustment)
Confirmation

TRIG: TP902/MDM-5P (K-3)

Preparations for adjustment

Step-3

- .Preset RV252 on MDM-5P board (C-5) to 3 o'clock position.

10-2-57. C DOC Equalizer Adjustment

Preparations for adjustment

Step-1

. Set DT SELECT switch to OFF.

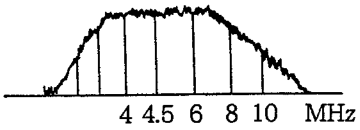
. Play back the RF sweep signal portion (0:00 to 2:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-1 (Metal RP Head)

TP653/MDM-5P (H-6)

Waveform of the oscilloscope



4.0 MHz: reference 100%
4.5 MHz: ---
6.0 MHz: 100 ± 20%
8.0 MHz: 80 ± 20%
10 MHz: 50 ± 30%
12 MHz: ---

Adjustment: (Metal RP Head Adjustment)
RV651/MDM-5P (G-5)

Preparations for adjustment

Step-2

. Set DT SELECT switch to VAR.

. Play back the RF sweep signal portion (0:00 to 2:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-2 (Metal DT Head)

TP653/MDM-5P (H-6)

Waveform of the oscilloscope

4.0 MHz: reference 100%
4.5 MHz: ---
6.0 MHz: 100 ± 20%
8.0 MHz: 80 ± 30%
10 MHz: 60 ± 30%
12 MHz: ---

Adjustment: (Metal DT Head Adjustment)
Confirmation

TRIG: TP902/MDM-5P (K-3)

Preparations for adjustment

Step-3

. Preset RV652 on MDM-5P board (H-5) to 3 o'clock position.

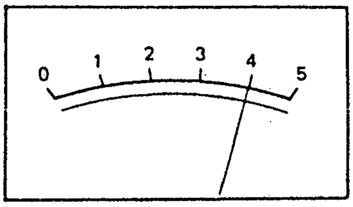
10-2-58. RF Meter Adjustment

Preparations for adjustment

- .Set DT SELECT switch to OFF.
- .Play back the 50% flat field signal portion (24:00 to 26:00) of an alignment tape CR5-1B PS.
- .Turn the TRACKING control knob on the control panel so that the pointer of the RF meter indicates the maximum RF level.

Specifications and adjustment

RF meter/control panel



The pointer of the meter should indicate 4.

Adjustment: RV267/MDM-5P (C-7)

10-2-59. Guard Band Width Adjustment (Metal)

Preparations for adjustment

- .Push the search dial to put the unit into the jog mode.
- .Set DT SELECT switch to OFF.
- .Play back the color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.
- .Turn the search dial so that the guard band is positioned in the center of the monitor screen with the search dial in jog mode.

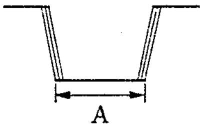
Specifications and adjustment

Step-1

(Y guard band width)

TP257/MDM-5P (D-6)

Waveform of the oscilloscope



A = 4.5 ± 0.5 ms

Adjustment: (Y guard band width)
RV265/MDM-5P (C-6)

Specifications and adjustment

Step-2

(C guard band width)

TP657/MDM-5P (D-6)

Waveform of the oscilloscope

A = 5.0 ± 0.5 ms

Adjustment: (C guard band width)
RV665/MDM-5P (G-7)

TRIG: TP902/MDM-5P (K-3)

10-2-60. Guard Band Width Adjustment (Oxide)

Preparations for adjustment

- Push the search dial to put the unit into the jog mode.
- Set DT SELECT switch to OFF.
- Play back the color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.
- Turn the search dial so that the guard band is positioned in the center of the monitor screen with the search dial in jog mode.

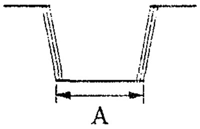
Specifications and adjustment

Step-1

(Y guard band width)

TP257/MDM-5P (D-6)

Waveform of the oscilloscope



A = 4.5 ± 0.5 ms

Adjustment: (Y guard band width)
RV266/MDM-5P (C-7)

Specifications and adjustment

Step-2

(C guard band width)

TP657/MDM-5P (D-6)

Waveform of the oscilloscope

A = 5.0 ± 0.5 ms

Adjustment: (C guard band width)
RV666/MDM-5P (G-7)

TRIG: TP902/MDM-5P (K-3)

10-2-61. Y Demodulator Output Level Adjustment

Preparations for adjustment

Step-1

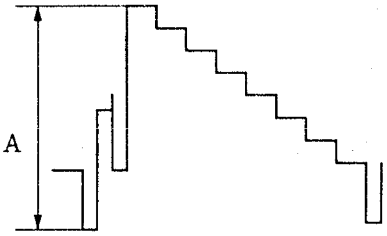
- .Set DT SELECT switch to OFF.
- .Play back the color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-1

TP405/MDM-5P (D-1)

Waveform of the oscilloscope



A = 1.00 ± 0.01 Vp-p

Adjustment: RV417/MDM-5P (D-1)

Preparations for adjustment

Step-2

- .Set DT SELECT switch to OFF.
- .Play back the color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.

Specifications and adjustment

Step-2

TP405/MDM-5P (D-1)

Waveform of the oscilloscope

A = 1.00 ± 0.01 Vp-p

Adjustment: RV412/MDM-5P (C-1)

TRIG: TP405/MDM-5P (D-1)

10-2-62. C Demodulator Output Level Adjustment

Preparations for adjustment

Step-1

.Set DT SELECT switch to OFF.

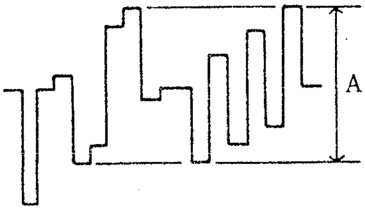
.Play back the color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-1

TP805/MDM-5P (J-1)

Waveform of the oscilloscope



A = 700 ± 10 mVp-p

Adjustment: RV817/MDM-5P (G-1)

Preparations for adjustment

Step-2

.Set DT SELECT switch to OFF.

.Play back the color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.

Specifications and adjustment

Step-2

TP805/MDM-5P (J-1)

Waveform of the oscilloscope

A = 525 ± 10 mVp-p

Adjustment: RV812/MDM-5P (H-1)

TRIG: TP805/MDM-5P (J-1)

NOTE: Above mentioned MDM-5P board adjustments (Section 10-2-1 thru Section 10-2-62) are completed, perform TBC adjustment (Section 10-3-1 and later).

10-3. TBC-17P BOARD ADJUSTMENT

10-3-1. Y Normal VCO Adjustment

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .EE mode

Specifications and adjustmnet

TP301/TBC-17P (A-1)
Digital voltmeter

2.5 ± 0.1 Vdc

Adjustment: LV300/TBC-17P (A-1)

10-3-2. C Normal VCO Adjustment

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .EE mode

Specifications and adjustmnet

TP401/TBC-17P (A-6)
Digital voltmeter

2.5 ± 0.1 Vdc

Adjustment: LV400/TBC-17P (A-5)

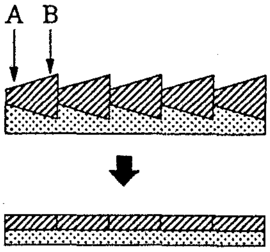
10-3-3. Y Write Clock Frequency Adjustment

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .EE mode

Specifications and adjustmnet

CH-1: TP305/TBC-17P (B-1)
CH-2: TP706/TBC-17P (G-7)
Add waveform of the oscilloscope



A = B (Make the lines to parallel.)
(Regardless of the position of the SYNC control on the sub-control panel)

Adjustment: RV304/TBC-17P (C-2)
SYNC control on the sub-control panel
Repeat adjustments RV304 and SYNC control alternately.

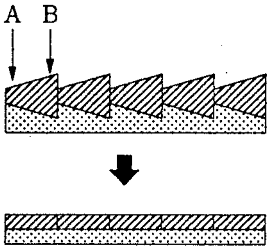
10-3-4. C Write Clock Frequency Adjustment

Preparations for adjustment

- Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- EE mode

Specifications and adjustmnet

CH-1: TP404/TBC-17P (B-5)
CH-2: TP706/TBC-17P (G-7)
Add waveform of the oscilloscope



A = B (Make the lines to parallel.) (Regardless of the position of the SYNC control on the sub-control panel)

Adjustment:	RV404/TBC-17P (C-7) SYNC control on the sub-control panel Repeat adjustments RV404 and SYNC control alternately.

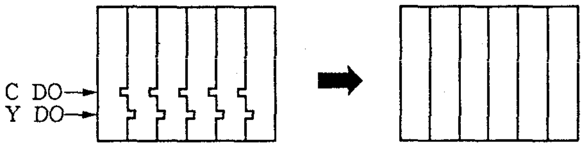
10-3-5. Impact Error Adjustment

Preparations for adjustment

- .Playback the 100% color-bar with drop out signal portion (26:00 to 28:00) of an alignment tape CR5-1B PS.
- .Turn the CHARACTER switch on the system control panel to OFF.
- .Connect a monitor TV to MONITOR OUTPUT connector.

Specifications and adjustmnet

Monitor screen



(A) The Y DO portions should disappear on the monitor screen by RV300/TBC-17P (A-2)
(B) The C DO portions should disappear on the monitor screen by RV400/TBC-17P (A-6)

Adjustment: RV300/TBC-17P (A-2)
RV400/TBC-17P (A-6)

NOTE: After adjustment is completed, turn the CHARACTER switch to ON.

10-3-6. Black Level Adjustment

Preparations for adjustment

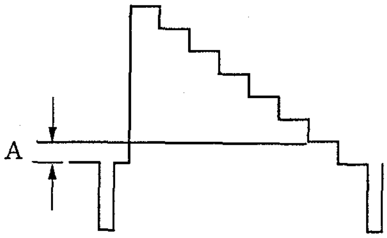
- .Playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustmnet

TP500/TBC-17P (L-1)
Waveform of the oscilloscope

A = 0 ± 5 mVp-p

Adjustment: RV152/TBC-17P (C-4)



TRIG: TP500/TBC-17P (L-1)

10-3-7. A/D Clamp Level Adjustment

Preparations for adjustment

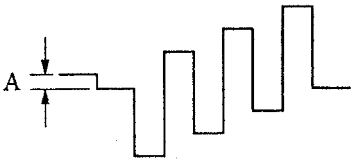
.Playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustmnet

Step-1

TP501/TBC-17P (M-1)

Waveform of the oscilloscope



A = 0 ± 5 mVp-p

Adjustment: RV201/TBC-17P (D-5)

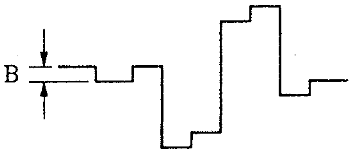
TRIG: TP501/TBC-17P (M-1)

Specifications and adjustmnet

Step-2

TP502/TBC-17P (M-1)

Waveform of the oscilloscope



B = 0 ± 5 mVp-p

Adjustment: Confirmation

TRIG: TP502/TBC-17P (M-1)

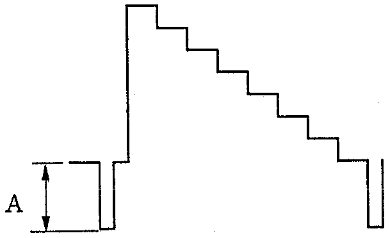
10-3-8. Monitor Y Out Sync Level Adjustment

Preparations for adjustment

- Playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustmnet

MONITOR OUTPUT Y connector/connector panel
Waveform of the waveform monitor



A = 300 ± 3 mVp-p

Adjustment: RV2/DIF-11P (K-7)

10-3-9. PB Level Adjustment (Metal)

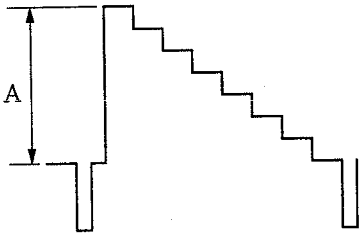
. Before performing this adjustment, Black Level Adjustment in Section 10-3-6. should be completed.

Preparations for adjustment

. Playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustmnet

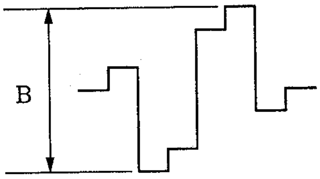
Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



A = 700 ± 7 mVp-p

Adjustment: RV150/TBC-17P (B-4)

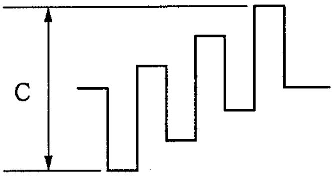
R-Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



B = 700 ± 7 mVp-p

Adjustment: RV151/TBC-17P (B-4)

B-Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



C = 700 ± 7 mVp-p

Adjustment: Confirmation

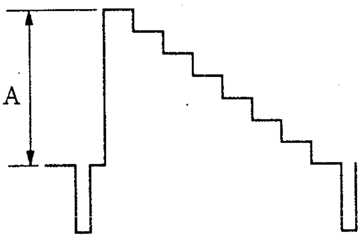
10-3-10. PB Level Adjustment (Oxide)

Preparations for adjustment

- .Playback the 75% color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.

Specifications and adjustmnet

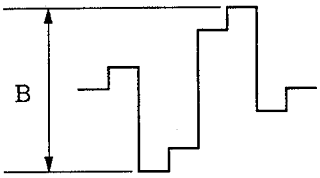
Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



A = 700 ± 7 mVp-p

Adjustment: RV412/MDM-5P (C-1)

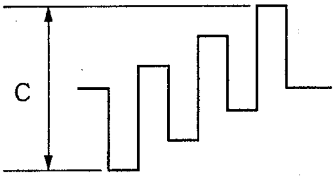
R-Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



B = 525 ± 6 mVp-p

Adjustment: RV812/MDM-5P (H-1)

B-Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



C = 525 ± 6 mVp-p

Adjustment: Confirmation

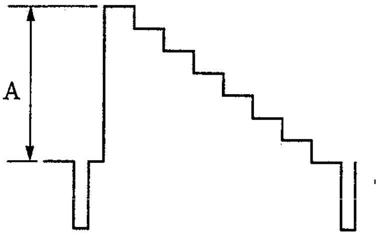
10-3-11. Monitor Output PB Level Adjustment

Preparations for adjustment

. Playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustmnet

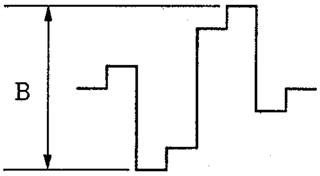
MONITOR OUTPUT Y connector/connector panel
Waveform of the waveform monitor
Y OUT Level



A = 700 ± 7 mVp-p

Adjustment: RV503/TBC-17P (L-1)

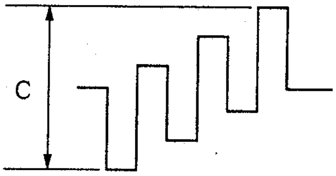
MONITOR OUTPUT R-Y connector/connector panel
Waveform of the waveform monitor
R-Y OUT Level



B = 700 ± 7 mVp-p

Adjustment: RV505/TBC-17P (M-1)

MONITOR OUTPUT B-Y connector/connector panel
Waveform of the waveform monitor
B-Y OUT Level



C = 700 ± 7 mVp-p

Adjustment: RV504/TBC-17P (L-1)

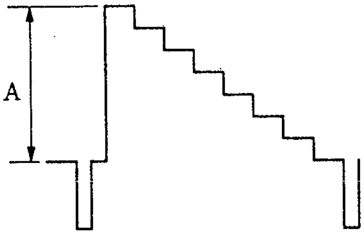
10-3-12. EE Level Adjustment (Metal)

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

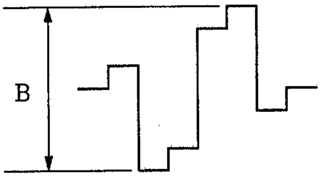
Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



A = 700 ± 7 mVp-p

Adjustment: RV1101/MDM-5P (N-1)

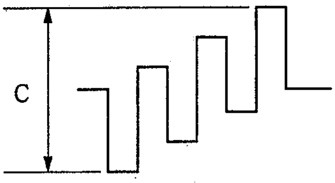
R-Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



B = 700 ± 7 mVp-p

Adjustment: RV1501/MDM-5P (P-1)

B-Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



C = 700 ± 7 mVp-p

Adjustment: Confirmation

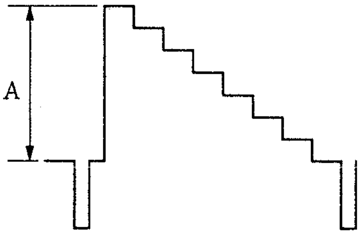
10-3-13. EE Level Adjustment (Oxide)

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20G (OXIDE).
- .EE mode

Specifications and adjustment

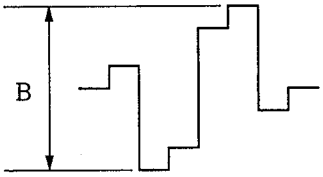
Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



A = 700 ± 7 mVp-p

Adjustment: RV1102/MDM-5P (P-1)

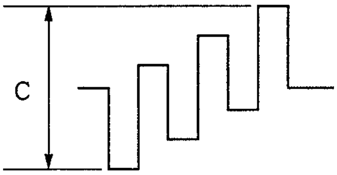
R-Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



B = 700 ± 7 mVp-p

Adjustment: RV1502/MDM-5P (P-1)

B-Y OUT connector/ D/A convertor Box
Waveform of the waveform monitor



C = 700 ± 7 mVp-p

Adjustment: Confirmation

10-3-14. Search Mode Picture Adjustment

Preparations for adjustment

- .Play back the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.
- .Set a DT SELECT switch to SRC.
- .Set RV406 on MDM-5P board (B-3) to the mechanical center position.

Preparations for adjustment

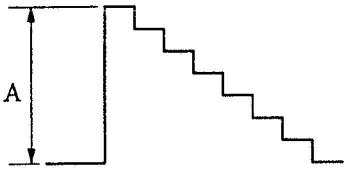
Step-1

- .Preset the output level at TP500 to 100% (5 div) on the oscilloscope.

Specifications and adjustment

Step-1

TP500/TBC-17P (L-1)
Waveform of the oscilloscope



A = 100%

Adjustment: VARIABLE control/oscilloscope

Preparations for adjustment

Step-2

- .Put the unit into REW mode.

Specifications and adjustment

Step-2

TP500/TBC-17P (L-1)
Waveform of the oscilloscope

A = 100 ± 10%

TP413/MDM-5P (A-4)
Digital Voltmeter

Adjustment: RV413/MDM-5P (A-3)
After adjustment is completed, memorize the dc level voltage at TP413 (called B volt).

Preparations for adjustment

Step-3

.Put the unit into F.FWD mode.

Specifications and adjustment

Step-3

TP500/TBC-17P (L-1)

Waveform of the oscilloscope

A = 100 ± 10%

Adjustment: RV413/MDM-5P (A-4)
After adjustment is completed, memorize the dc level voltage at TP413 (called C volt).

TRIG: MONITOR Y OUTPUT/Connector panel

Preparations for adjustment

Step-4

.Put the unit into STILL mode.

.Set RV413 on MDM-5P board (A-3) to the mechanical center position.

Specifications and adjustment

Step-4

TP413/MDM-5P (A-4)

Digital voltmeter:

Setting voltage = (average dc level between B and C) ± 0.005 Vdc

Adjustment: RV406/MDM-5P (B-3)

Preparations for adjustment

Step-5

.Put the unit into F.FWD mode again.

Specifications and adjustment

Step-5

TP500/TBC-17P (L-1)

Waveform of the oscilloscope

A = 100 ± 5%

Adjustment: RV413/MDM-5P (A-3)

Preparations for adjustment

Step-6

. Put the unit into REW mode again.

Specifications and adjustment

Step-6

TP500/TBC-17P (L-1)

Waveform of the oscilloscope

A = 100 ± 10%

If not to meet the specification, adjust by RV406.
When the adjustment is performed, repeat Steps 5 and 6.

Adjustment: RV406/MDM-5P (B-3)

TRIG: MONITOR Y OUTPUT/Connector panel

10-3-15. Search Mode Picture DC Level Adjustment

Preparations for adjustment

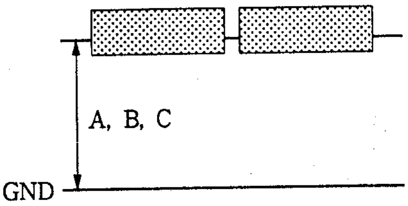
Step-1

- .Set a DT SELECT switch to OFF.
- .Playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-1

TP402/MDM-5P (C-3)



Measure the dc level at the pedestal portion of the video signal from GND. (This level called A.)

TRIG: TP902/MDM-5P (K-3)

Preparations for adjustment

Step-2

- .Set a DT SELECT switch to OFF.
- .Put the unit into F.FWD/REW (42 times of normal speed) mode at the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-2

TP402/MDM-5P (C-3)

Measure the dc level at the pedestal portion of the video signal from GND. (This level called B.)

B = A ± 40 mVdc

Adjustment: RV414/MDM-5P (B-3)

TRIG: TP902/MDM-5P (K-3)

Preparations for adjustment

Step-3

- .Set a DT SELECT switch to OFF.
- .Put the unit into F.FWD/REW (10 times of normal speed) mode at the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-3

TP802/MDM-5P (G-3)

Measure the dc level at the pedestal portion of the video signal from GND. (This level called C.)

C = A ± 40 mVdc

Adjustment: RV814/MDM-5P (G-3)

TRIG: TP903/MDM-5P (K-3)

10-3-16. TBC VCO Adjustment for High Speed Search

Preparations for adjustment

Step-1

- .Set a DT SELECT switch to OFF.
- .Playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-1

TP302/TBC-17P (D-2)

2.60 ± 0.05 Vdc

Adjustment: RV302/TBC-17P (D-3)

Preparations for adjustment

Step-2

.Set a DT SELECT switch to OFF.

.Put the unit into F.FWD mode, and playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-2

IC300-31pin/TBC-17P (C-1)

2.60 ± 0.10 Vdc

Adjustment: RV301/TBC-17P (D-3)

Preparations for adjustment

Step-3

.Set a DT SELECT switch to OFF.

.Put the unit into REW mode, and playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-3

IC300-31pin/TBC-17P (C-1)

More than 1.2 Vdc
If not to meet the specification, fine adjust RV301 to meet the following dc voltage.
1.20 ± 0.05 Vdc

Adjustment: (fine adjust)
RV301/TBC-17P (D-3)

TRIG: TP302/TBC-17P (D-2)

10-4. RP BOARD ADJUSTMENT

10-4-1. Y Ach REC Current Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 017)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

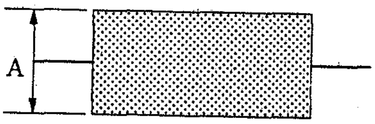
Step-1

.Supply a 50% flat field signal to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20M (METAL).
.Set switch S2 on RP-53P board (C-4) to OFF (RP mode).
.Short between TP7 (C-4) and TP8 (C-4) on RP-53P board with a shorting clip lead.
.Put the unit into REC mode.

Specifications and adjustment

Step-1

Connect a current probe to the shorting clip lead between TP7 and TP8, and measure the waveform of an oscilloscope.



50 +0/-10 mA

Adjustment:
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 017 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: TP701/AFM-8 (B-1)

Preparations for adjustment

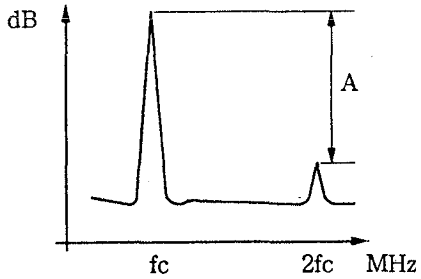
Step-2

- .Connect a spectrum analyzer to OUTPUT terminal of the oscilloscope.
- .Supply a 50% flat field signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .Set switch S2 on RP-53P board (C-4) to OFF (RP mode).
- .Short between TP7 (C-4) and TP8 (C-4) on RP-53P board with a shorting clip lead.
- .Short between TP5 (C-1) and E103 (C-1) on RP-53P board with a shorting clip lead.
- .Put the unit into REC mode.

Specifications and adjustment

Step-2

Connect a current probe to the shorting clip lead between TP7 and TP8, and observe the picture of the spectrum analyzer.



Minimize the 2fc portion of the waveform.
$A \geqq 40$ dB

Adjustment: RV5/RP-53P (C-4)

TRIG: TP701/AFM-8 (B-1)

NOTE: After adjustments are completed, remove two shorting clip leads, and reset S2 on RP-53P board to ON state.

10-4-2. Y Bch REC Current Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 018)

. Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

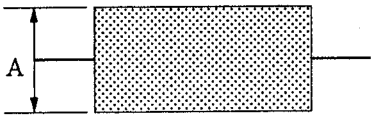
Step-1

. Supply a 50% flat field signal to SERIAL V/A INPUT connector.
. Insert a blank tape BCT-20M (METAL).
. Set switch S3 on RP-53P board (B-4) to OFF (RP mode).
. Short between TP9 (B-4) and TP10 (B-4) on RP-53P board with a shorting clip lead.
. Put the unit into REC mode.

Specifications and adjustment

Step-1

Connect a current probe to the shorting clip lead between TP9 and TP10, and measure the waveform of an oscilloscope.



50 +0/-10 mA

Adjustment:
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 018 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: TP701/AFM-8 (B-1)

Preparations for adjustment

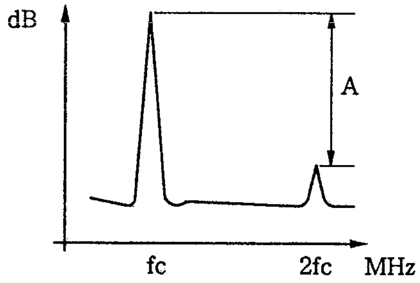
Step-2

- .Connect a spectrum analyzer to OUTPUT terminal of the oscilloscope.
- .Supply a 50% flat field signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .Set switch S3 on RP-53P board (B-4) to OFF (RP mode).
- .Short between TP9 (B-4) and TP10 (B-4) on RP-53P board with a shorting clip lead.
- .Short between TP6 (B-1) and E103 (C-1) on RP-53P board with a shorting clip lead.
- .Put the unit into REC mode.

Specifications and adjustment

Step-2

Connect a current probe to the shorting clip lead between TP9 and TP10, and observe the picture of the spectrum analyzer.



Minimize the 2fc portion of the waveform.
A ≧ 40 dB

Adjustment: RV6/RP-53P (B-4)

TRIG: TP701/AFM-8 (B-1)

NOTE: After adjustments are completed, remove two shorting clip leads, and reset S3 on RP-53P board to ON state.

10-4-3. Y Overall Frequency Response Adjustment (Metal)

Preparations for adjustment

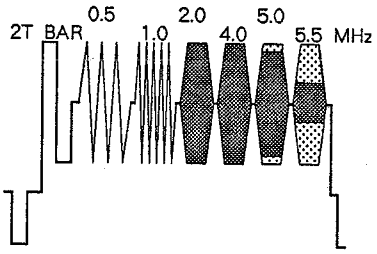
Step-1

- .Supply a 60% multi burst signal (WIDE) to SERIAL V/A INPUT connector.
- .Set DT SELECT switch to OFF.
- .Set CONFI switch on the control panel to ON.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.

Specifications and adjustment

Step-1

Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Ach and Bch)



2T BAR : reference 100% (0 dB)
0.5 MHz: 0 +0.3/-0.4 dB
1.0 MHz: 0 +0.3/-0.4 dB
2.0 MHz: 0 +0.4/-0.3 dB
4.0 MHz: 0 +0.3/-0.4 dB
5.0 MHz: 0 +0.3/-0.8 dB
5.5 MHz: -1.5 +1.3/-0.8 dB

The level deference between Ach and Bch is less than 0.5 dB (0.5 MHz to 5 MHz).

Adjustment: (Ach OA frequency response)
RV1/RP-53P (C-4)
After adjustment for Ach is completed, confirm the Section 10-4-1. Y Ach REC current adjustment (metal).
(Bch OA frequency response)
RV3/RP-53P (C-4)
After adjustment for Bch is completed, confirm the Section 10-4-2. Y Bch REC current adjustment (metal).

Preparations for adjustment

Step-2

- .Set DT SELECT switch on the control panel to OFF.
- .Insert a blank tape BCT-20M (METAL) and record for about 30 seconds.
- .Play back the self-recorded portion.

Specifications and adjustment

Step-2

Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Ach and Bch)

The specifications are the same as Step-1.

Adjustment: (For Ach and Bch)
Confirmation

10-4-4. Y Ach REC Current Adjustment (Oxide)
(VIDEO ADJUST MENU: ITEM 021)

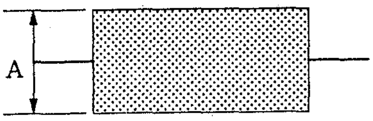
.Refer to “VIDEO ADJUST of the maintenance menu” in the headed portion of Section 10.

Preparations for adjustment

- .Supply a 50% flat field signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20G (OXIDE).
- .Set switch S2 on RP-53P board (C-4) to OFF (RP mode).
- .Short between TP7 (C-4) and TP8 (C-4) on RP-53P board with a shorting clip lead.
- .Put the unit into REC mode.

Specifications and adjustment

Connect a current probe to the shorting clip lead between TP7 and TP8, and measure the waveform of the oscilloscope.



33 ± 5 mA

Adjustment:
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 021 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: TP701/AFM-8 (B-1)

NOTE: After adjustment is completed, remove shorting clip lead, and reset S2 on RP-53P board to ON state.

10-4-5. Y Bch REC Current Adjustment (Oxide)
(VIDEO ADJUST MENU:ITEM 022)

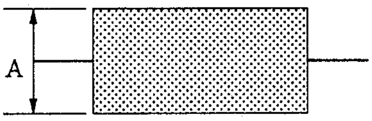
. Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

- Supply a 50% flat field signal to SERIAL V/A INPUT connector.
- Insert a blank tape BCT-20G (OXIDE).
- Set switch S3 on RP-53P board (B-4) to OFF (RP mode).
- Short between TP9 (B-4) and TP10 (B-4) on RP-53P board with a shorting clip lead.
- Put the unit into REC mode.

Specifications and adjustment

Connect a current probe to the shorting clip lead between TP9 and TP10, and measure the waveform of the oscilloscope.



33 ± 5 mA

Adjustment:
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 022 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: TP701/AFM-8 (B-1)

NOTE: After adjustment is completed, remove shorting clip lead, and reset S3 on RP-53P board to ON state.

10-4-6. Y Overall Frequency Response Adjustment (Oxide)

Preparations for adjustment

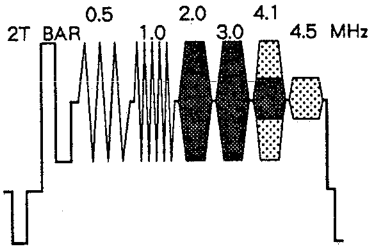
Step-1

- .Supply a 60% multi burst signal (NARROW) to SERIAL V/A INPUT connector.
- .Set DT SELECT switch to OFF.
- .Set CONFI switch on the control panel to ON.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode.

Specifications and adjustment

Step-1

Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Ach and Bch)



2T BAR : reference 100% (0 dB)
0.5 MHz: 0 ± 0.3 dB
1.0 MHz: 0 +0.4/-0.3 dB
2.0 MHz: 0 +0.4/-0.5 dB
3.0 MHz: -1.0 ± 1.0 dB
4.1 MHz: -3.0 ± 2.3 dB

The level deference between Ach and Bch is less than 0.5 dB (0.5 MHz to 3 MHz).

Adjustment: (Ach OA frequency response)
RV2/RP-53P (C-4)
After adjustment for Ach is completed, confirm the Section 10-4-4. Y Ach REC current adjustment (oxide).
(Bch OA frequency response)
RV4/RP-53P (C-4)
After adjustment for Bch is completed, confirm the Section 10-4-5. Y Bch REC current adjustment (oxide).

Preparations for adjustment

Step-2

.Set DT SELECT switch on the control panel to OFF.

.Insert a blank tape BCT-20G (OXIDE) and record for about 30 seconds.

.Play back the self-recorded portion.

Specifications and adjustment

Step-2

Y OUT/ D/A convertor box.

Waveform of the waveform monitor

The specifications are the same as Step-1.

Adjustment: (For Ach and Bch) Confirmation

10-4-7. Y Overall Over Modulation Check (Metal/Oxide)

Preparations for adjustment

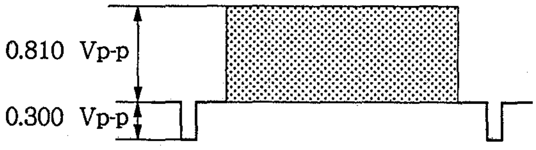
.Prepare BKDV-4224A/D (SONY).

.Set the BKDV-4224A/D as follows, and connect it to SERIAL V/A INPUT connector.

TEST SIG: SWEEP

PRESET/VAR: VAR

Y GAIN:



.Connect a monitor TV to MONITOR OUTPUT Y connector.

.Set switch S1-bit3 on TBC-17P board to ON.

.Set CONFI switch on the control panel to ON.

.Insert a blank tape BCT-20M (METAL).

Preparations for adjustment

Step-1

.Set CONFI switch to ON.

.Put the unit into REC mode.

Specifications and adjustment

Step-1

Monitor TV

Over modulation should not be appeared in the confidence picture during recording mode on the monitor screen.

Preparations for adjustment

Step-2

.Play back the self-recorded portion in normal PLAY, FWD (1/30 to X3), REV (1/30 to X1) and STILL modes.

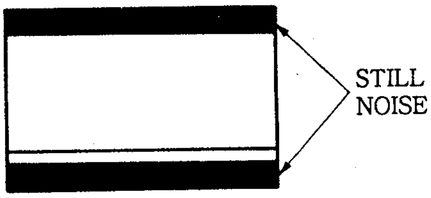
Specifications and adjustment

Step-2

Monitor TV

Over modulation should not be appeared in the play back picture in each mode on the monitor screen.

In the STILL mode, place the guard band noise to upper and lower portions, and confirm the over modulation in the center of the monitor screen.



Preparations for adjustment

Step-3

.Set DT SELECT switch to OFF.

.Play back the self-recorded portion in normal PLAY, FWD (1/30 to X3), REV (1/30 to X1) and STILL modes.

Specifications and adjustment

Step-3

Monitor TV

Over modulation should not be appeared in the play back picture in each mode on the monitor screen.

In the STILL mode, place the guard band noise to upper and lower portions, and confirm the over modulation in the center of the monitor screen.

Preparations for adjustment

Step-4

- Insert a blank tape BCT-20G (OXIDE).

Specifications and adjustment

Step-4

Perform confirmations as the same procedures as Step-1 thru. Step-3.

NOTE: After confirmations are completed, reset switch S1-bit3 on TBC-17P board to OFF and PRESET/VAR switch on the BKDV-4224A/D to PRESET.

10-4-8. C Ach REC Current Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 019)

- Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

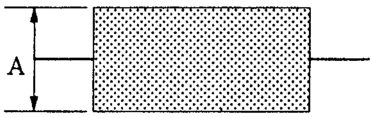
Step-1

- Supply a 50% flat field signal (pedestal level) to SERIAL V/A INPUT connector.
- Insert a blank tape BCT-20M (METAL).
- Set switch S101 on RP-53P board (A-4) to OFF (RP mode).
- Short between TP107 (A-4) and TP108 (A-4) on RP-53P board with a shorting clip lead.
- Set switch S1 on AFM-8 board (G-1) to ON (AFM mode).
- Put the unit into REC mode.

Specifications and adjustment

Step-1

Connect a current probe to the shorting clip lead between TP107 and TP108, and measure the waveform of an oscilloscope.



50 ± 5 mA

Adjustment: While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 019 of the maintenance menu. After spec. is met, press S304 on SS-48DP board.

TRIG: TP701/AFM-8 (B-1)

Preparations for adjustment

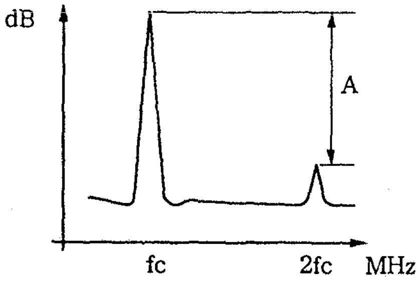
Step-2

- Connect a spectrum analyzer to OUTPUT terminal of the oscilloscope.
- Supply a 50% flat field signal (pedestal level) to SERIAL V/A INPUT connector.
- Insert a blank tape BCT-20M (METAL).
- Set switch S101 on RP-53P board (A-4) to OFF (RP mode).
- Short between TP107 (A-4) and TP108 (A-4) on RP-53P board with a shorting clip lead.
- Short between TP105 (B-1) and E103 (C-1) on RP-53P board with a shorting clip lead.
- Put the unit into REC mode.

Specifications and adjustment

Step-2

- Connect a current probe to the shorting clip lead between TP107 and TP108, and observe the picture of the spectrum analyzer.



Minimize the 2fc portion of the waveform.
A ≧ 40 dB

Adjustment: RV105/RP-53P (B-4)

TRIG: TP701/AFM-8 (B-1)

NOTE: After adjustments are completed, remove two shorting clip leads, and reset S101 on RP-53P board to ON state.

10-4-9. C Bch REC Current Adjustment (Metal)
(VIDEO ADJUST MENU: ITEM 020)

.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

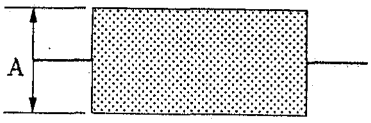
Step-1

.Supply a 50% flat field signal (pedestal level) to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20M (METAL).
.Set switch S102 on RP-53P board (A-4) to OFF (RP mode).
.Short between TP109 (A-4) and TP110 (A-4) on RP-53P board with a shorting clip lead.
.Set switch S1 on AFM-8 board (G-1) to ON (AFM mode).
.Put the unit into REC mode.

Specifications and adjustment

Step-1

Connect a current probe to the shorting clip lead between TP109 and TP110, and measure the waveform of an oscilloscope.



50 ± 5 mA

Adjustment: While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 020 of the maintenance menu. After spec. is met, press S304 on SS-48DP board.

TRIG: TP701/AFM-8 (B-1)

Preparations for adjustment

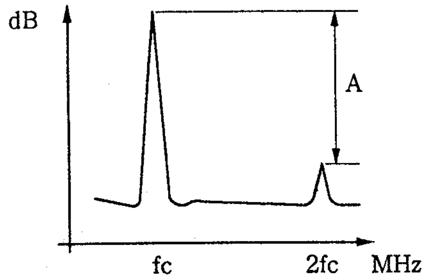
Step-2

.Connect a spectrum analyzer to OUTPUT terminal of the oscilloscope.
.Supply a 50% flat field signal (pedestal level) to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20M (METAL).
.Set switch S102 on RP-53P board (A-4) to OFF (RP mode).
.Set switch S1 on AFM-8 board (G-1) to ON (AFM mode).
.Short between TP109 (A-4) and TP110 (A-4) on RP-53P board with a shorting clip lead.
.Short between TP106 (B-1) and E103 (C-1) on RP-53P board with a shorting clip lead.
.Put the unit into REC mode.

Specifications and adjustment

Step-2

Connect a current probe to the shorting clip lead between TP109 and TP110, and observe the picture of the spectrum analyzer.



Minimize the 2fc portion of the waveform.
A ≧ 40 dB

Adjustment: RV106/RP-53P (A-4)

TRIG: TP701/AFM-8 (B-1)

NOTE: After adjustments are completed, remove two shorting clip leads, and reset S102 on RP-53P board to ON state.

10-4-10. R-Y Overall Frequency Response Adjustment (Metal)

Preparations for adjustment

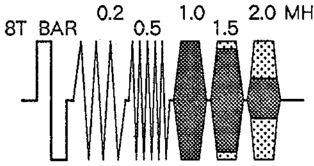
Step-1

.Supply a 60% multi burst signal to SERIAL V/A INPUT connector.
.Set DT SELECT switch to OFF.
.Set CONFI switch on the control panel to ON.
.Insert a blank tape BCT-20M (METAL).
.Put the unit into REC mode.

Specifications and adjustment

Step-1

R-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Ach and Bch)



8T BAR : reference 100% (0 dB)
0.2 MHz: 0 ± 0.3 dB
0.5 MHz: 0 ± 0.3 dB
1.0 MHz: 0 +0.4/-0.3 dB
1.5 MHz: -0.4 +0.3/-0.4 dB
2.0 MHz: -2.0 +1.5/-0.8 dB

The level deference between Ach and Bch is less than 0.5 dB (0.2 MHz to 1.5 MHz).

Adjustment: (Ach OA frequency response)
RV101/RP-53P (B-1)
After adjustment for Ach is completed, confirm the Section 10-4-8. C Ach REC current adjustment (metal).
(Bch OA frequency response)
RV103/RP-53P (A-4)
After adjustment for Bch is completed, confirm the Section 10-4-9. C Bch REC current adjustment (metal).

Preparations for adjustment

Step-2

.Set DT SELECT switch on the control panel to OFF.
.Insert a blank tape BCT-20M (METAL) and record for about 30 seconds.
.Play back the self-recorded portion.

Specifications and adjustment

Step-2

R-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

The specifications are the same as Step-1.

Adjustment: (For Ach and Bch)
Confirmation

10-4-11. B-Y Overall Frequency Response Check (Metal)

Preparations for adjustment

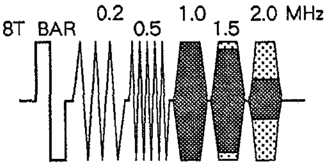
Step-1

- .Supply a 60% multi burst signal to SERIAL V/A INPUT connector.
- .Set DT SELECT switch to OFF.
- .Set CONFI switch on the control panel to ON.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.

Specifications and adjustment

Step-1

B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Ach and Bch)



8T BAR : reference 100% (0 dB)
0.2 MHz: 0 ± 0.3 dB
0.5 MHz: 0 ± 0.3 dB
1.0 MHz: 0 +0.4/-0.3 dB
1.5 MHz: -0.4 +0.3/-0.4 dB
2.0 MHz: -2.0 +1.5/-0.8 dB

The level deference between Ach and Bch is less than 0.5 dB (0.2 MHz to 1.5 MHz).

Adjustment: (Ach OA frequency response)
Confirmation
(Bch OA frequency response)
Confirmation

Preparations for adjustment

Step-2

- .Set DT SELECT switch on the control panel to OFF.
- .Insert a blank tape BCT-20M (METAL) and record for about 30 seconds.
- .Play back the self-recorded portion.

Specifications and adjustment

Step-2

B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

The specifications are the same as Step-1.

Adjustment: (For Ach and Bch)
Confirmation

10-4-12. C Ach REC Current Adjustment (Oxide)
(VIDEO ADJUST MENU: ITEM 023)

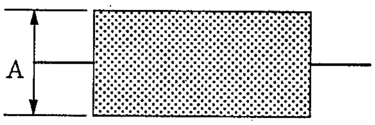
. Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

- . Supply a 50% flat field signal (pedestal level) to SERIAL V/A INPUT connector.
- . Insert a blank tape BCT-20G (OXIDE).
- . Set switch S101 on RP-53P board (A-4) to OFF (RP mode).
- . Short between TP107 (A-4) and TP108 (A-4) on RP-53P board with a shorting clip lead.
- . Put the unit into REC mode.

Specifications and adjustment

Connect a current probe to the shorting clip lead between TP107 and TP108, and measure the waveform of an oscilloscope.



35 ± 5 mA

Adjustment: While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 023 of the maintenance menu. After spec. is met, press S304 on SS-48DP board.

TRIG: TP701/AFM-8 (B-1)

NOTE: After adjustment is completed, remove a shorting clip lead, and reset S101 on RP-53P board to ON state.

10-4-13. C Bch REC Current Adjustment (Oxide)
(VIDEO ADJUST MENU: ITEM 024)

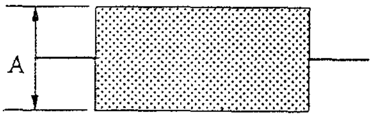
.Refer to "VIDEO ADJUST of the maintenance menu" in the headed portion of Section 10.

Preparations for adjustment

.Supply a 50% flat field signal (pedestal level) to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20G (OXIDE).
.Set switch S102 on RP-53P board (A-4) to OFF (RP mode).
.Short between TP109 (A-4) and TP110 (A-4) on RP-53P board with a shorting clip lead.
.Put the unit into REC mode.

Specifications and adjustment

Connect a current probe to the shorting clip lead between TP109 and TP110, and measure the waveform of an oscilloscope.



35 ± 5 mA

Adjustment:
While pressing the SEARCH button, turn the search dial to meet the spec. according to the ITEM 024 of the maintenance menu.
After spec. is met, press S304 on SS-48DP board.

TRIG: TP701/AFM-8 (B-1)

NOTE: After adjustment is completed, remove a shorting clip lead, and reset S102 on RP-53P board to ON state.

10-4-14. R-Y Overall Frequency Response Adjustment (Oxide)

Preparations for adjustment

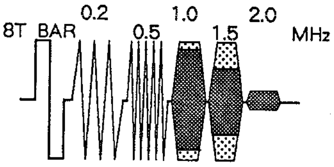
Step-1

- .Supply a 60% multi burst signal to SERIAL V/A INPUT connector.
- .Set DT SELECT switch to OFF.
- .Set CONFI switch on the control panel to ON.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode.

Specifications and adjustment

Step-1

R-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Ach and Bch)



8T BAR : reference 100% (0 dB)
0.2 MHz: 0 ± 0.3 dB
0.5 MHz: 0 ± 0.3 dB
1.0 MHz: -0.5 ± 0.8 dB
1.5 MHz: -1.2 +1.2/-1.3 dB
2.0 MHz: -----

The level deference between Ach and Bch is less than 0.5 dB (0.2 MHz to 1 MHz).

Adjustment: (Ach OA frequency response)
RV102/RP-53P (B-4)
After adjustment for Ach is completed, confirm the Section 10-4-12. C Ach REC current adjustment (oxide).
(Bch OA frequency response)
RV104/RP-53P (A-4)
After adjustment for Bch is completed, confirm the Section 10-4-13. C Bch REC current adjustment (oxide).

Preparations for adjustment

Step-2

- .Set DT SELECT switch on the control panel to OFF.
- .Insert a blank tape BCT-20G (OXIDE) and record for about 30 seconds.
- .Play back the self-recorded portion.

Specifications and adjustment

Step-2

R-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

The specifications are the same as Step-1.

Adjustment: (For Ach and Bch)
Confirmation

10-4-15. B-Y Overall Frequency Response Check (Oxide)

Preparations for adjustment

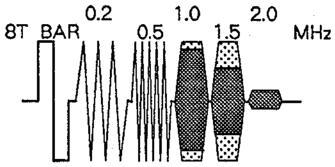
Step-1

- .Supply a 60% multi burst signal to SERIAL V/A INPUT connector.
- .Set DT SELECT switch to OFF.
- .Set CONFI switch on the control panel to ON.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode.

Specifications and adjustment

Step-1

B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Ach and Bch)



8T BAR : reference 100% (0 dB)
0.2 MHz: 0 ± 0.3 dB
0.5 MHz: 0 ± 0.3 dB
1.0 MHz: -0.5 ± 0.8 dB
1.5 MHz: -1.2 +1.2/-1.3 dB
2.0 MHz: -----

The level deference between Ach and Bch is less than 0.5 dB (0.2 MHz to 1 MHz).

Adjustment: (For Ach and Bch)
Confirmation

Preparations for adjustment

Step-2

- .Set DT SELECT switch on the control panel to OFF.
- .Insert a blank tape BCT-20G (OXIDE) and record for about 30 seconds.
- .Play back the self-recorded portion.

Specifications and adjustment

Step-2

B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

The specifications are the same as Step-1.

Adjustment: (For Ach and Bch)
Confirmation

10-4-16. C Overall Over Modulation Check (Metal/Oxide)

Preparations for adjustment

- .Supply a 100% H sweep signal to SERIAL V/A INPUT connector.
- .Connect a monitor TV to MONITOR OUTPUT Y connector.
- .Set switch S1-bit2 on TBC-17P board to ON.
- .Set CONFI switch on the control panel to ON.
- .Insert a blank tape BCT-20M (METAL).

Preparations for adjustment

Step-1

- .Set DT SELECT switch to VAR.
- .Put the unit into REC mode.

Specifications and adjustment

Step-1

Monitor TV

Over modulation should not be appeared in the confidence picture during recording mode on the monitor screen.

Preparations for adjustment

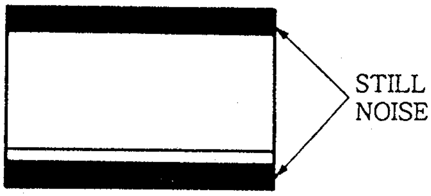
Step-2

- .Play back the self-recorded portion in normal PLAY, FWD (1/30 to X3), REV (1/30 to X1) and STILL modes.

Specifications and adjustment

Step-2

Monitor TV



Over modulation should not be appeared in the play back picture in each mode on the monitor screen. In the STILL mode, place the guard band noise to upper and lower portions, and confirm the over modulation in the center of the monitor screen.

Preparations for adjustment

Step-3

- .Set DT SELECT switch to OFF.
- .Play back the self-recorded portion in normal PLAY, FWD (1/30 to X3), REV (1/30 to X1) and STILL modes.

Specifications and adjustment

Step-3

Monitor TV

Over modulation should not be appeared in the play back picture in each mode on the monitor screen. In the STILL mode, place the guard band noise to upper and lower portions, and confirm the over modulation in the center of the monitor screen.

Preparations for adjustment

Step-4

- .Insert a blank tape BCT-20G (OXIDE).

Specifications and adjustment

Step-4

Perform confirmations as the same procedures as Step-1 thru. Step-3.

NOTE: After confirmations are completed, reset switch S1-bit2 on TBC-17P board to OFF.

10-4-17. AFM REC Current Adjustment

Preparations for adjustment

- .Connect a spectrum analyzer to OUTPUT terminal of an oscilloscope.
- .Supply a 50% flat field signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .Set switch S101 on RP-53P board (A-4) to OFF.
- .Set switch S1 on AFM-8 board (G-1) to OFF (AFM mode).
- .Short between TP107 (A-4) and TP108 (A-4) on RP-53P board with a shorting clip lead.
- .Short between TP105 (B-1) and TP106 (B-1) on RP-53P board with a shorting clip lead.
- .Put the unit into REC mode.

Step-1

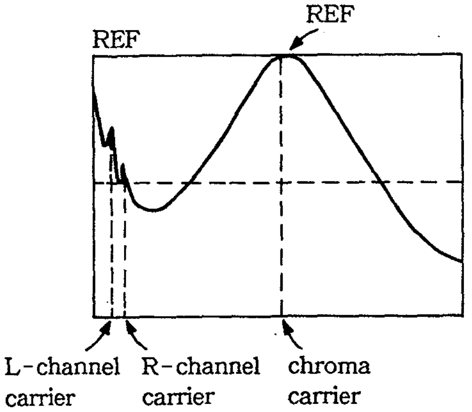
.Set the spectrum analyzer as follows:

CENTER	:5 MHz
SPAN	:10 MHz
RBW	:1 kHz
VBW	:1 kHz

Specifications and adjustment

Step-1

Connect a current probe to the shorting clip lead between TP107 and TP108, and observe the picture of the spectrum analyzer.



Adjust the peak of the chroma carrier to the top of the scale.

Adjustment: LEVEL control/spectrum analyzer

Preparations for adjustment

Step-2

.Set the spectrum analyzer as follows:

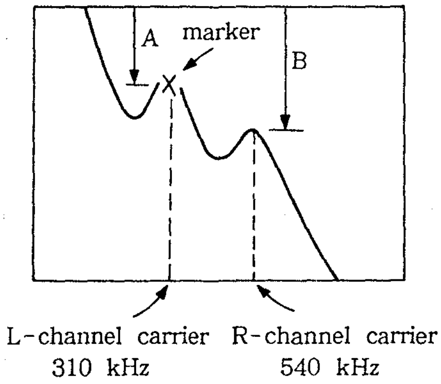
CENTER :1 MHz
SPAN :2 MHz
RBW :1 kHz
VBW :1 kHz

.Set the marker to 540 kHz.

Specifications and adjustment

Step-2

Picture of the spectrum analyzer.



At 540 kHz portion: B = -26.0 ± 0.2 dB

Adjustment: RV109/RP-53P (A-2)

Preparations for adjustment

Step-3

.Set the marker to 310 kHz.

Specifications and adjustment

Step-3

Picture of the spectrum analyzer.

At 310 kHz portion: A = -23.0 ± 0.5 dB

Adjustment: Confirmation

Preparations for adjustment

Step-4

.Remove a shorting clip lead between TP107 and TP108, and reset S101 on RP-53P board to ON state.

.Set switch S102 on RP-53P board (A-4) to OFF.

.Short between TP109 (A-4) and TP110 (A-4) on RP-53P board with a shorting clip lead.

.Confirm Shorting between TP105 (B-1) and TP106 (B-1) on RP-53P board with a shorting clip lead.

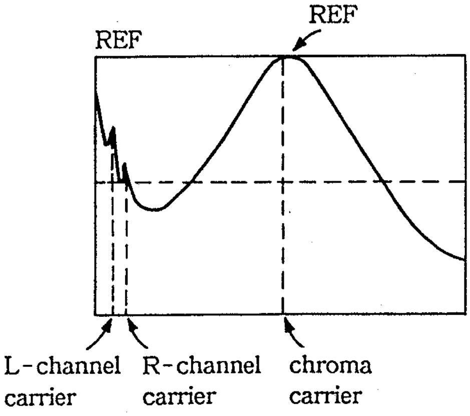
.Set the spectrum analyzer as follows:

CENTER :5 MHz
SPAN :10 MHz
RBW :1 kHz
VBW :1 kHz

Specifications and adjustment

Step-4

Connect a current probe to the shorting clip lead between TP109 and TP110, and observe the picture of the spectrum analyzer.



Adjust the peak of the chroma carrier to the top of the scale.

Adjustment: LEVEL control/spectrum analyzer

Preparations for adjustment

Step-5

.Set the spectrum analyzer as follows:

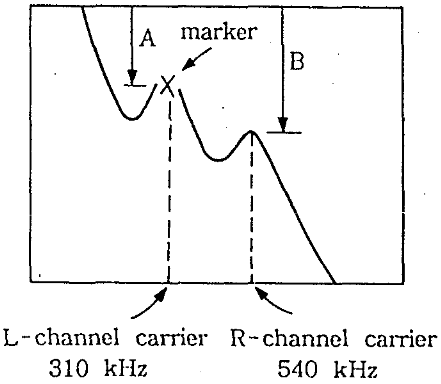
CENTER :1 MHz
SPAN :2 MHz
RBW :1 kHz
VBW :1 kHz

.Set the marker to 540 kHz.

Specifications and adjustment

Step-5

Picture of the spectrum analyzer.



At 540 kHz portion: B = -26.0 ± 0.2 dB

Adjustment: RV110/RP-53P (A-2)

Preparations for adjustment

Step-6

.Set the marker to 310 kHz.

Specifications and adjustment

Step-6

Picture of the spectrum analyzer.

At 310 kHz portion: A = -23.0 ± 0.5 dB

Adjustment: Confirmation

NOTE: After adjustments are completed, remove two shorting clip leads, and reset S102 to ON state.

10-4-18. Rotary Erase Current Adjustment

Preparations for adjustment

Step-1

- .Connect a frequency counter to the OUTPUT terminal of an oscilloscope.
- .Short between TP601 on AFM-8 board (A-1) and E801 (C-1) with a short clip lead.

Specifications and adjustment

Step-1

Connect a probe of the oscilloscope to the red colored jumper wire of "W1" (A-1) on AFM-8 board.

Waveform of the oscilloscope

23.5 ± 0.5 Vp-p

Frequency counter

20.0 ± 0.5 MHz

Adjustment: LV601/AFM-8 (A-2)
RV601/AFM-8 (A-1)

NOTE: After adjustment is completed, remove a short clip lead.

Preparations for adjustment

Step-2

- .Connect a frequency counter to the OUTPUT terminal of an oscilloscope.
- .Short between TP602 on AFM-8 board (B-1) and E801 (C-1) with a short clip lead.

Specifications and adjustment

Step-2

Connect a probe of the oscilloscope to the red colored jumper wire of "W2" (A-4) on AFM-8 board.

Waveform of the oscilloscope

23.5 ± 0.5 Vp-p

Frequency counter

20.0 ± 0.5 MHz

Adjustment: LV602/AFM-8 (B-2)
RV602/AFM-8 (B-1)

NOTE: After adjustment is completed, remove a short clip lead.

Preparations for adjustment

Step-3

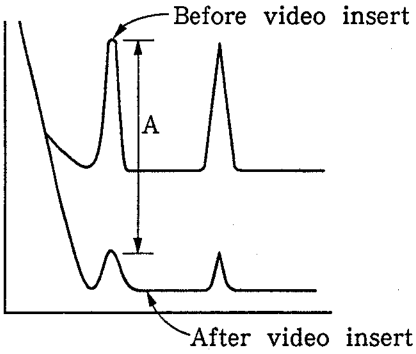
- .Supply a 50% flat field signal to SERIAL V/A INPUT connector.
- .Connect a spectrum analyzer to OUTPUT terminal of the oscilloscope.
- .Insert a blank tape BCT-20M (METAL).
- .Set switch S1 on AFM-8 board (G-1) to OFF.
- .Record a 50% flat field signal about 1 minute.
- .Rewind a tape about 30 seconds at self recorded portion.
- .Set switch S1 on AFM-8 board (G-1) to ON.
- .Put the unit into VIDEO INSERT mode about 25 seconds.
- .Rewind a tape about one minutes, and play back a recorded portion in this step.

Specifications and adjustment

Step-3

TP903/AFM-8 (-)

Picture of the spectrum analyzer



Level difference between original recorded portion and video inserted portion is more than 25 dB.

Adjustment: Confirmation

NOTE: After adjustment is completed, reset switch S1 on AFM-8 board to OFF.

10-4-19. AFM Carrier Frequency Adjustment

- Before performing following AFM adjustments, the video system adjustments are already completed.

Preparations for adjustment

- Supply no signal to SERIAL V/A INPUT connector.
- Insert a blank tape BCT-20M (METAL).
- Put the unit into REC mode.

Specifications and adjustment

Step-1
TP101/AFM-8 (E-1)
TP102/AFM-8 (E-2)
Frequency counter

310 ± 1 kHz

Adjustment: RV101/AFM-8 (F-1)
RV102/AFM-8 (F-2)

Specifications and adjustment

Step-2
TP201/AFM-8 (F-1)
TP202/AFM-8 (F-2)
Frequency counter

540 ± 1 kHz

Adjustment: RV201/AFM-8 (G-1)
RV202/AFM-8 (G-2)

10-4-20. AFM PB RF Level Adjustment

Preparations for adjustment

- .Play back a 100% color-bar signal with FM track 400 Hz sine wave (25 kHz deviation) portion (14:00 to 16:30) of an alignment tape CR5-1B PS.
- .Set the DT SELECT switch to OFF.

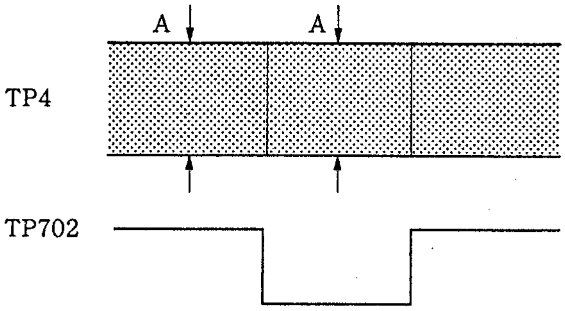
Specifications and adjustment

Step-1

TP4/AFM-8 (C-3)

TP702/AFM-8 (E-1)

Waveform of the oscilloscope



A = 100 ± 15 mVp-p

Adjustment: RV1/AFM-8 (B-5)
RV2/AFM-8 (B-4)

Specifications and adjustment

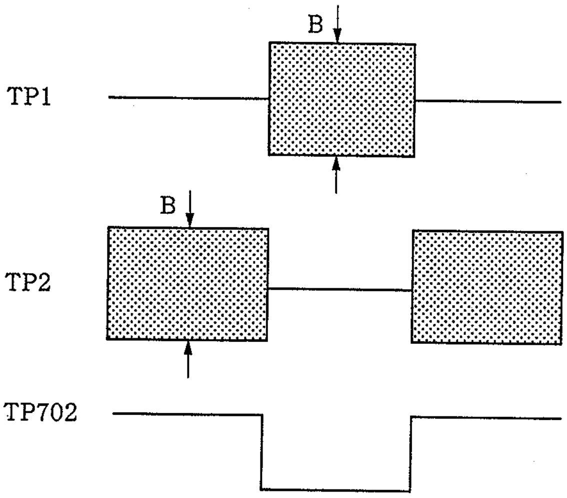
Step-2 (CH-A)

TP1/AFM-8 (B-5)

TP2/AFM-8 (B-5)

TP702/AFM-8 (E-1)

Waveform of the oscilloscope



B = 550 ± 100 mVp-p

Adjustment: Confirmation

TRIG: TP702/AFM-8 (E-1)

10-4-21. AFM DT PB RF Level Check

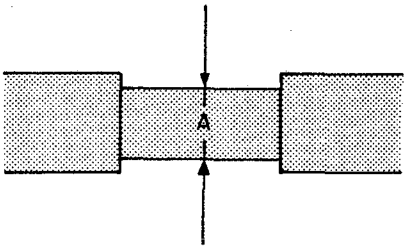
Preparations for adjustment

.Play back a 100% color-bar signal with FM track 400 Hz sine wave (25 kHz deviation) portion (14:00 to 16:30) of an alignment tape CR5-1B PS.

.Set the DT SELECT switch to VAR.

Specifications and adjustment

Step-1 (CH-3)
TP3/AFM-8 (C-3)
TP702/AFM-8 (E-1)
Waveform of the oscilloscope



A = 1.5 ± 0.3 Vp-p
Confirm that the RF waveform lacking is not existed.

Adjustment: (CH-3)
Confirmation

Specifications and adjustment

Step-2 (CH-4)
TP6/AFM-8 (C-3)
TP702/AFM-8 (E-1)
Waveform of the oscilloscope

A = 1.5 ± 0.3 Vp-p
Confirm that the RF waveform lacking is not existed.

Adjustment: (CH-4)
Confirmation

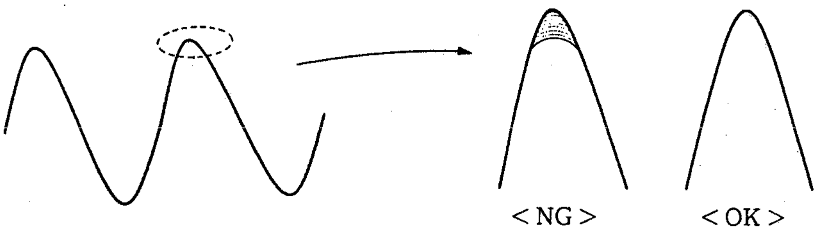
10-4-22. AFM PB RF Level Difference Adjustment

Preparations for adjustment

.Playback a 100% color-bar signal with FM track 400 Hz sine wave (25 kHz deviation) portion (14:00 to 16:30) of an alignment tape CR5-1B PS.

Specifications and adjustment

Step-1 (CH-3)
TP301/AFM-8 (F-7)



Adjust the top of the waveform as shown in the figure.

Adjustment: (CH-3)
RV104/AFM-8 (E-3)

TRIG: TP301/AFM-8 (F-7)

Specifications and adjustment

Step-2 (CH-4)
TP501/AFM-8 (F-7)

Adjust the top of the waveform as shown in the figure.

Adjustment: (CH-4)
RV204/AFM-8 (G-3)

TRIG: TP501/AFM-8 (F-7)

10-4-23. AFM PB NR Input Level Adjustment

Preparations for adjustment

.Playback a 100 color-bar signal with FM track 400 Hz sine wave (25 kHz deviation) portion (14:00 to 16:30) of an alignment tape CR5-1B PS.

Specifications and adjustment

CH-3: TP103/AFM-8 (F-4)
CH-4: TP203/AFM-8 (G-4)

-15.0 ± 0.2 dB

Adjustment: For CH-3
RV105/AFM-8 (E-3)
For CH-4
RV205/AFM-8 (F-3)

10-4-24. AFM PB Level Adjustment

Preparations for adjustment

.Playback a 100% color-bar signal with FM track 400 Hz sine wave (25 kHz deviation) portion (14:00 to 16:30) of an alignment tape CR5-1B PS.

Specifications and adjustment

CH-3: TP301/AFM-8 (F-7)
CH-4: TP501/AFM-8 (F-7)

+4.0 ± 0.1 dB

Adjustment: For CH-3
RV302/AFM-8 (F-6)
For CH-4
RV502/AFM-8 (G-6)

10-4-25. AFM Overall Level Adjustment

Preparations for adjustment

Step-1 (EE Level Set)

- .Set the audio signal oscillator to 400 Hz, +4 dBm.
- .Install a blank tape BCT-20M (METAL).
- .EE mode

Specifications and adjustment

Step-1

TP103/AFM-8 (F-4)
TP203/AFM-8 (G-4)

-19.3 ± 0.2 dB

Adjustment: OUTPUT level control/audio signal oscillator

Preparations for adjustment

Step-2

- .Put the unit into REC mode about 20 seconds, and playback the self-recorded portion.

Specifications and adjustment

Step-2

CH-3: TP103/AFM-8 (F-4)
CH-4: TP203/AFM-8 (G-4)

+4.0 ± 0.3 dB

Adjustment: For CH-3
RV103/AFM-8 (D-2)
For CH-4
RV203/AFM-8 (F-2)

SECTION 11
OVERALL VIDEO ALIGNMENT

(Equipment Required)

.Oscilloscope	(TEKTRONIX 2445 or equivalent)
.Signal Genrator	
Serial Digital	(TEKTRONIX TSG-422 OP-1S or equivalent)
Component	(TEKTRONIX TSG-300 MOD SP1 or equivalent) (LEADER 425 BETACAM SP SPEC.)
Composite	(TEKTRONIX 1411 or equivalent) (LEADER 425 BETACAM SP SPEC.)
Y/C	(TEKTRONIX TSG-131 or equivalent) (LEADER 425 BETACAM SP SPEC.)
Digital Composite	(TEKTRONIX TSG-271 or equivalent) (LEADER 425 BETACAM SP SPEC.)
.D/A A/D Convertor	
PFV-D100 with BKPF-102C	(SONY)
PFV-D100 with BKPF-101C	(SONY)
D/A Convertor Box	(TEKTRONIX or equivalent)
.Network Analyzer	(ANRITSU MS-420B or equivalent)
.Waveform Monitor	
VM-700A or equivalent	
Component	(TEKTRONIX WFM300/WFM300A/1781 or equivalent)
Composite	(TEKTRONIX 1481C/1751/1781R or equivalent)
.Spectrum Analyzer	(ADVANTEST R4131 B/D or equivalent)
.Sweep Generator	(SHIBASOKU VS-12CX/2 or equivalent)
.Current Prove	(TEKTRONIX P6022 or equivalent)
.Picture Monitor	
.Deviation Checker	(SONY EW-580)
.Head Coupling Tool	
.Frequency Counter	
.Blank Tape (oxide)	BCT-20G
.Blank Tape (metal)	BCT-20M

NOTE: "Blank Tape" indicates a cassette tape on which no video/audio signals are recorded. (An CTL signal is only recorded.)

.Alignment Tape CR5-1BPS (part No. 8-960-096-91)
Contents

TIME (min s)	VIDEO TRACK	AFM
0:00 to 2:00	RF Sweep Marker 1, 2, 4, 6, 8, 10, 12 MHz	No Signal
2:00 to 5:00	60% H Sweep (CTDM) Marker 0.5, 1, 2, 3, 4, 5 MHz	No Signal
5:00 to 8:00	Pulse & Bar (CTDM)	No Signal
8:00 to 11:00	Multi Burst Y: 0.5, 1, 2, 4.5, 5.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz	No Signal
11:00 to 14:00	Pulse & Bar	No Signal
14:00 to 16:30	100% Color-bar	400 Hz Sine Wave 25 kHz Deviation
16:30 to 17:00	100% Color-bar	400 Hz Sine Wave 75 kHz Deviation
17:00 to 19:00	50% Bowtie & 10T	No Signal
19:00 to 22:00	Line 17A	No Signal
22:00 to 24:00	Quad Phase	No Signal
24:00 to 26:00	50% Flat Field	No Signal
26:00 to 28:00	100% Color-bar with Dropout	No Signal
28:00 to 30:00	Composite H Sweep with VISC	No Signal

.Alignment Tape CR5-2A PS (part No. 8-960-098-44)
Contents

TIME (min s)	VIDEO TRACK
0:00 to 3:00	75% Color-bar
3:00 to 6:00	60% Multi Burst Y: 0.5, 1, 2, 3, 4.1, 4.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz
6:00 to 9:00	50% Bowtie & 10T
9:00 to 11:00	Pulse & Bar
11:00 to 13:00	Quad Phase
13:00 to 15:00	C-Monoscope Switching position is shifted.

(Switch Setting)

Following setting should not be changed in position unless otherwise specified.

<Upper Control Panel>
REMOTE/LOCAL: LOCAL
TRACKING: FIXED
AUDIO INPUT SELECT: ANALOG
AUDIO MIXING: OFF
AUDIO MONITOR: ST/AFM
REC level control (CH-1 to CH-4): preset (push)
PB level control (CH-1 to CH-4): preset (push)

<Lower Control Panel>
DT SELECT: OFF
CTL/TC/U-BIT: CTL
PB/PB/EE: PB/EE
CONFI: ON

<Sub Control Panel>
CAPSTAN LOCK: 2FD
TC EXT/INT: INT
REC INHIBIT: OFF
TBC CONTROL: LOCAL
Y/C DELAY: PRESET
BLACK LEVEL: PRESET
CHROMA: PRESET
VIDEO: PRESET
DIGITAL AUDIO INPUT: AES/EBU
DIGITAL AUDIO EMPHASIS: OFF
AFM INPUT: CH-3/4

<System Control Panel>
VITC: ON
SYNCHRONIZE: ON
CHARACTER: ON
VTR CONTROL: INT
TBC REF: INPUT VIDEO
LEVEL REF: OFF

<Connector panel>
REF VIDEO INPUT 75-ohm: ON
AUDIO INPUT LEVEL (CH-1 to CH-4): HIGH
AUDIO INPUT 600-ohm (CH-1 to CH-4):ON

<DIF Board Switch Setting>
S102 (C-1): OFF
S801 (J-1): OFF
S800 (H-1): 0

<MDM Board Switch Setting>
S901 Bit-1 to Bit-4 (L-1): All OFF
S902 Bit-1 to Bit-8 (K-1): All OFF
S401 (B-1): OFF (Y NR OFF)
S801 (G-1): OFF (C NR OFF)
S1601 (E-4): Y TEST (right side)
S1602 (E-4): C TEST (right side)
S1603 (E-1): Y FS (up side)
S1604 (F-1): C FS (right side)
S1101 (N-5): NR EN OFF (left side)

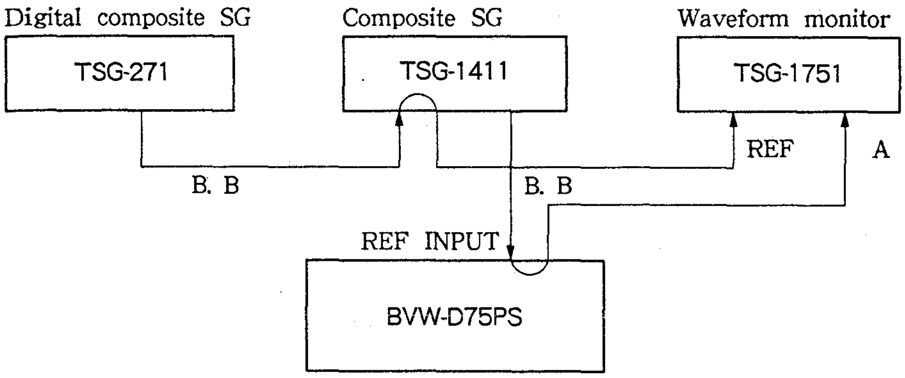
<TBC Board Switch Setting>
S1 Bit-1 to Bit-8 (J-1): All OFF

NOTE: Color-bar signal

When performing the electrical alignment, the specification of color-bar signal should use 100/0/100/0 color-bar signal without notice.

11-1. REF CF PULSE ADJUSTMENT

(Connection)


Digital composite SG
TSG-271
Composite SG
TSG-1411
Waveform monitor
TSG-1751
REF
A
B. B
B. B
REF INPUT
BVW-D75PS

Preparations for adjustment

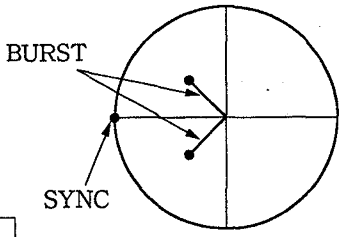
. Connect the equipments as shown in the above figure.
. Set the TBC REF switch on the system control panel to REF.

Specifications and adjustment

Step-1

REF VIDEO/Composite SG

Picture of the vectorscope (SCH mode)



Set the dot of the sync on the right position on the scale.

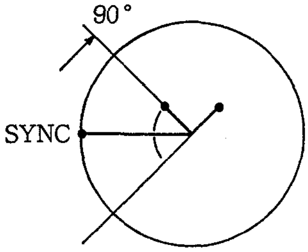
Adjustment: PHASE control/vectorscope

Specifications and adjustment

Step-2

REF VIDEO/Composite SG

Picture of the vectorscope (SCH mode)



Adjust the SCH to +90 degrees.

Adjustment: SUBCARRIER control/1411

Preparations for adjustment

Step-3

.Turn RV704/TBC-17 board (M-6) clockwise fully.

.Turn RV704 counterclockwise gradually.

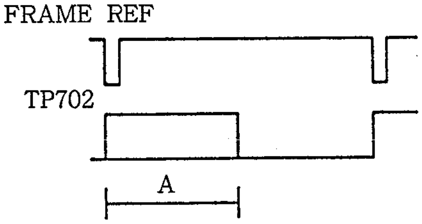
Specifications and adjustment

Step-3

CH-1:TP702/TBC-17P (N-6) or CN136-37B/TBC-17P

CH-2:FRAME REF terminal/TSG-271

Waveform of the oscilloscope



FRAME REF pulse is in the high level portion of TP702.

Adjustment: RV704/TBC-17P (M-6)

Specifications and adjustment

Step-4

When the SCH of the vectorscope is changed in the range of about +/- 10 degrees, confirm that the CF PULSE changes at the 90 degrees position.

Adjustment: SUBCARRIER control/1411

Preparations for adjustment

Step-5

.Return the SCH to 0 degree of the vectorscope.

Specifications and adjustment

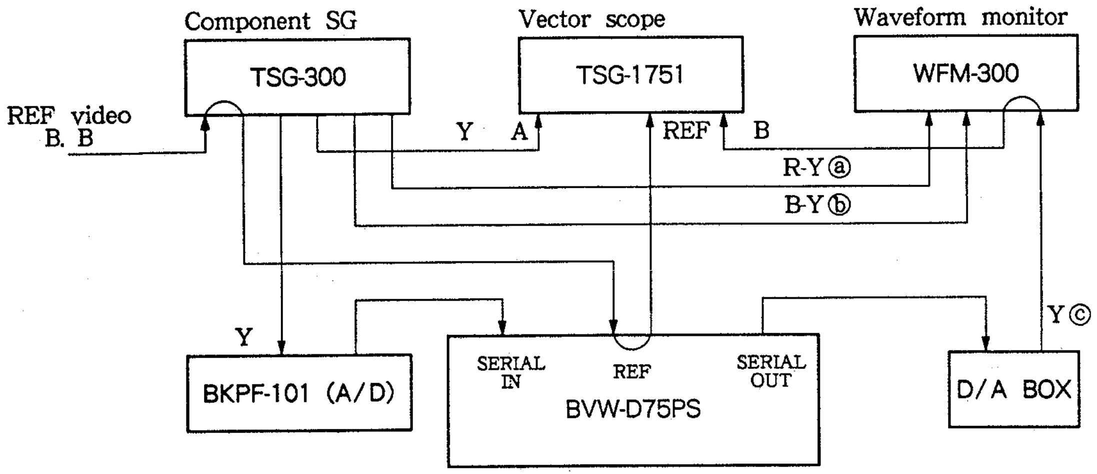
Step-5

Adjustment: Confirm the “A” period of the waveform at TP702 is High level.

TRIG: FRAME REF/TSG-271

11-2. PB VIDEO PHASE ADJUSTMENT

(Connection)


Component SG
TSG-300
Vector scope
TSG-1751
Waveform monitor
WFM-300
REF video
B. B
Y
A
REF
B
R-Y ⓐ
B-Y ⓑ
Y ⓒ
Y
BKPF-101 (A/D)
SERIAL IN
REF
SERIAL OUT
BVW-D75PS
D/A BOX

The connecting cables ⓐ, ⓑ and ⓒ (for R-Y, B-Y and Y signals) should be the same length.

Preparations for adjustment

Step-1

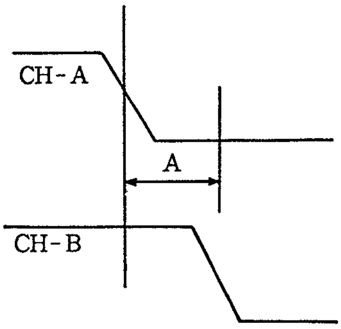
- .Play back the 50% bowtie & 10T signal portion (17:00 to 19:00) of an alignment tape CR5-1B PS.
- .Set the SYNC FINE control on the subcontrol panel to the mechanical center position.

Specifications and adjustment

Step-1

Y OUT/ D/A convertor box.

Waveform of the vectorscope (WFM mode)



A = 0 ± 0.1 us

Coincides the phase on CH-B with that on CH-A when the CH-A and CH-B switches are pressed alternately. (Reference waveform is CH-A.)

Adjustment: SYNC control/subcontrol panel

Preparations for adjustment

Step-2

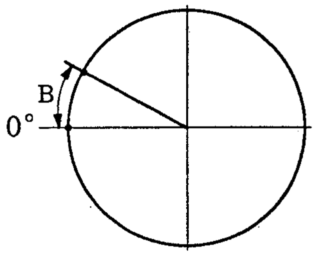
.Press CH-A button of the vectorscope.

Specifications and adjustment

Step-2

Y OUT/Analog component SG

Waveform of the vectorscope (SCH mode)



B = 0 degree

Adjustment: PHASE cotrol/vectorscope

Preparations for adjustment

Step-3

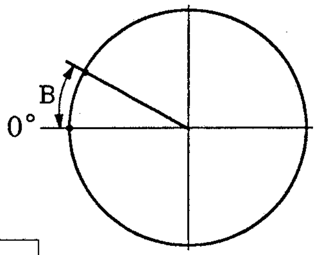
.Press CH-B button of the vectorscope.

Specifications and adjustment

Step-3

Y OUT/ D/A convertor box.

Waveform of the vectorscope (SCH mode)



B = 0 degree

Adjustment: SYNC FINE control/subcontrol panel

Preparations for adjustment

Step-4

.Supply a 50% bowtie signal to SERIAL V/A INPUT connector.

.Playback the 50% bowtie & 10T signal portion (17:00 to 19:00) of an alignment tape CR5-1B PS.

.Set DT SELECT switch to OFF.

.PB mode

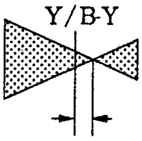
Specifications and adjustment

Step-4

Y OUT/ D/A convertor box.

Waveform of the waveform monitor

(Bowtie mode)



Y/B-Y: 0 ± 10 ns

(Minimize the Y/B-Y delay.)

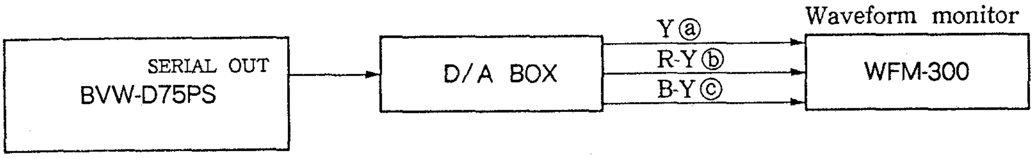
Adjust the dip point of the playback signal to the center marker.

Reference is the B-Y signal of the signal generator.

Adjustment: RV303/TBC-17P (C-2)

11-3. PB Y/C DELAY ADJUSTMENT (METAL)

(Connection)


SERIAL OUT
BVW-D75PS
D/A BOX
Y ⓐ
R-Y ⓑ
B-Y ⓒ
Waveform monitor
WFM-300

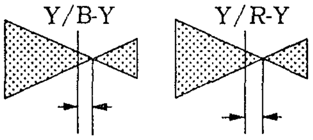
The connecting cables ⓐ, ⓑ and ⓒ (for Y, R-Y and B-Y signals) should be the same length.

Preparations for adjustment

- .Play back the 50% bowtie & 10T signal portion (17:00 to 19:00) of an alignment tape CR5-1B PS.
- .Set the DT SELECT switch to OFF.

Specifications and adjustments

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)

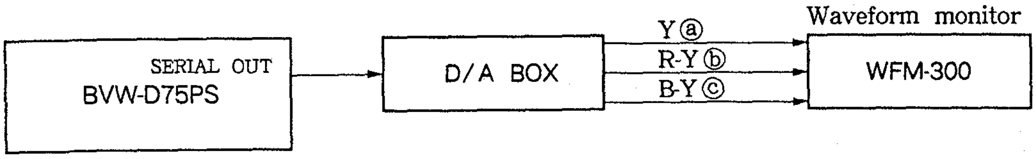


Y/R-Y: 0 ± 10 ns
Y/B-Y: 0 ± 10 ns
Adjust the dip point to the center marker.
(Minimize the Y/R-Y delay and Y/B-Y delay.)

Adjustments: For Y/R-Y
RV403/TBC-17P (C-7)
For Y/B-Y
Confirmation

11-4. PB Y/C DELAY ADJUSTMENT (OXIDE)

(Connection)


SERIAL OUT
BVW-D75PS
D/A BOX
Y ⓐ
R-Y ⓑ
B-Y ⓒ
Waveform monitor
WFM-300

The connecting cables ⓐ, ⓑ and ⓒ (for Y, R-Y and B-Y signals) should be the same length.

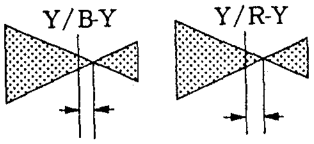
Preparations for adjustment

.Playback the 50% bowtie & 10T signal portion (6:00 to 9:00) of an alignment tape CR5-2A PS.

.Set the DT SELECT switch to OFF.

Specifications and adjustments

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)

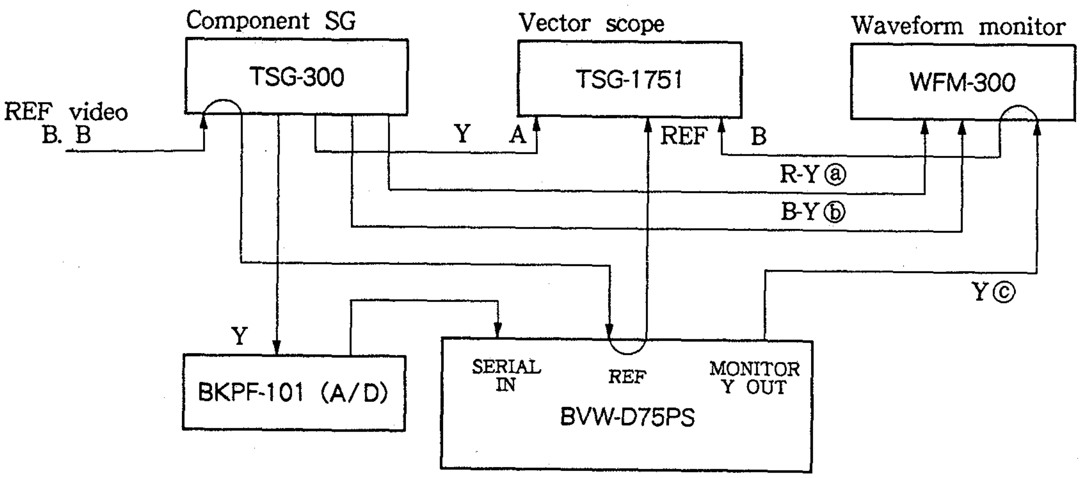


Y/R-Y: 0 ± 10 ns
Y/B-Y: 0 ± 10 ns
Adjust the dip point to the center marker.
(Minimize the Y/R-Y delay and Y/B-Y delay.)

Adjustments: For Y/R-Y
RV401/TBC-17P (D-7)
For Y/B-Y
Confirmation

11-5. MONITOR PB VIDEO PHASE ADJUSTMENT

(Connection)


Component SG
TSG-300
Vector scope
TSG-1751
Waveform monitor
WFM-300
REF video
B. B
Y
A
REF
B
R-Y ⓐ
B-Y ⓑ
Y ⓒ
Y
BKPF-101 (A/D)
SERIAL IN
REF
MONITOR Y OUT
BVW-D75PS

The connecting cables ⓐ, ⓑ and ⓒ (for R-Y, B-Y and Y signals) should be the same length.

Preparations for adjustment

Step-1

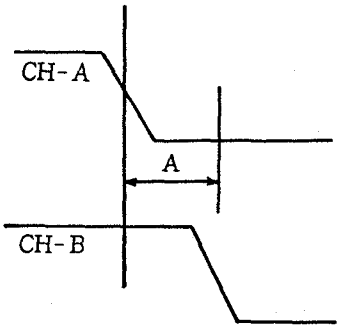
- Playback the 50% bowtie & 10T signal portion (17:00 to 19:00) of an alignment tape CR5-1B PS.
- Set the SYNC FINE control on the subcontrol panel to the mechanical center position.

Specifications and adjustment

Step-1

MONITOR OUTPUT Y/connector panel

Waveform of the vectorscope (WFM mode)



A = 0 ± 0.1 us

Coincides the phase on CH-B with that on CH-A when the CH-A and CH-B switches are pressed alternately. (Reference waveform is CH-A.)

Adjustments: SYNC control/subcontrol panel

Preparations for adjustment

Step-2

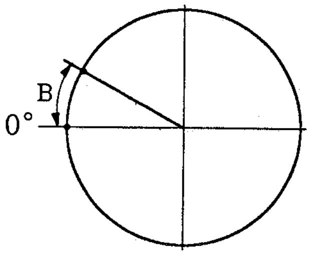
.Press CH-A button of the vectorscope.

Specifications and adjustment

Step-2

Y OUT/Analog component SG

Waveform of the vectorscope (SCH mode)



B = 0 degree

Adjustments: PHASE cotrol/vectorscope

Preparations for adjustment

Step-3

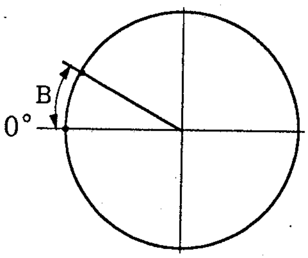
.Press CH-B button of the vectorscope.

Specifications and adjustment

Step-3

MONITOR OUTPUT Y/connector panel

Waveform of the vectorscope (SCH mode)



B = 0 degree

Adjustments: SYNC FINE control/subcontrol panel

Preparations for adjustment

Step-4

.Supply a 50% bowtie signal to SERIAL V/A INPUT connector.

.Playback the 50% bowtie & 10T signal portion (17:00 to 19:00) of an alignment tape CR5-1B PS.

.Set DT SELECT switch to OFF.

.PB mode

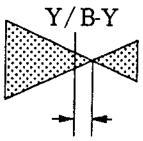
Specifications and adjustment

Step-4

MONITOR OUTPUT Y/connector panel

Waveform of the waveform monitor

(Bowtie mode)



Y/B-Y: 0 ± 10 ns

(Minimize the Y/B-Y delay.)

Adjust the dip point of the playback signal to the center marker.

Reference is the B-Y signal of the signal generator.

Adjustments: RV500/TBC-17P (K-1)

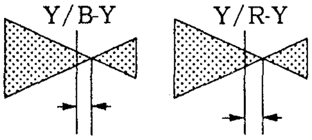
11-6. MONITOR PB Y/C C/C DELAY ADJUSTMENT

Preparations for adjustment

- .Playback the 50% bowtie & 10T signal portion (17:00 to 19:00) of an alignment tape CR5-1-B PS.
- .Set the DT SELECT switch to OFF.

Specifications and adjustment

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)



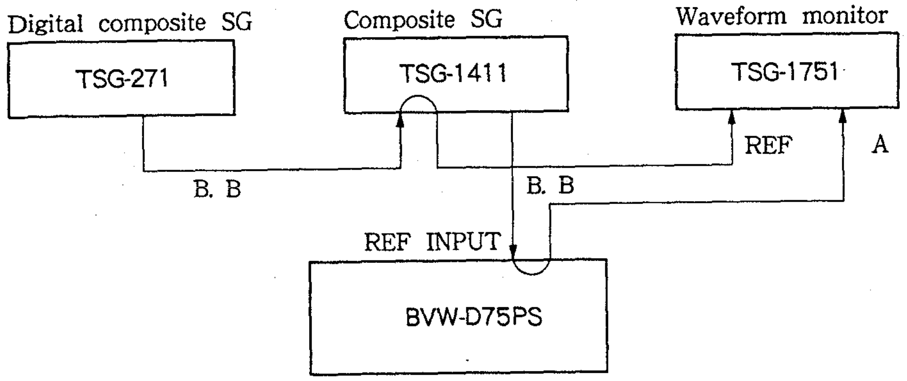
Y/R-Y: 0 ± 10 ns
Y/B-Y: 0 ± 10 ns
R-Y/B-Y: less than 10 ns
Adjust the dip point to the center marker.
(Minimize the Y/R-Y delay, Y/B-Y delay and R-Y/B-Y delay.)

Adjustments: For Y/R-Y
RV501/TBC-17P (K-1)
For Y/B-Y
RV502/TBC-17P (K-1)
For R-Y/B-Y
Confirmation

11-7. OUTPUT SCH ADJUSTMENT

. Before performing this adjustment, Step-1 through Step-3 of Section 11-5 should be completed.

(Connection)


Digital composite SG
TSG-271
Composite SG
TSG-1411
Waveform monitor
TSG-1751
REF
A
B. B
B. B
REF INPUT
BVW-D75PS

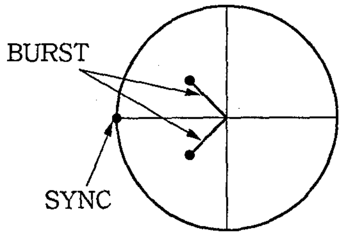
Preparations for adjustment

. Connect the black burst signal to REF VIDEO INPUT connector.
. EE mode

Step-1

Specifications and adjustment

Step-1
REF VIDEO OUTPUT/connector panel
Picture of the vectorscope (SCH mode)



Set the dot of the sync on the right position on the scale.

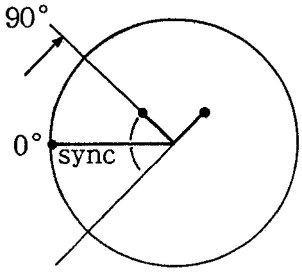
Adjustments: PHASE control/vectorscope

Specifications and adjustment

Step-2

REF VIDEO OUTPUT/connector panel

Picture of the vectorscope (SCH mode)



Adjust the SCH to +90 degrees.

Adjustments: SUBCARRIER control/1411

Preparations for adjustment

Step-3

. Turn RV702/TBC-17P board or RV1 on DUS-494/TBC-17P board clockwise fully.

. Turn RV702 to the counterclockwise gradually.

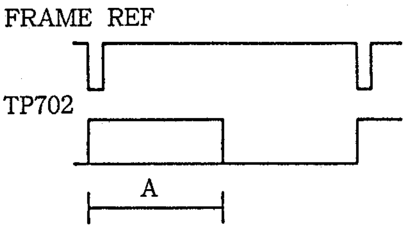
Specifications and adjustment

Step-3

CH-1:TP702/TBC-17P (N-6) or CN136-37B/TBC-17P

CH-2:FRAME REF terminal/TSG-271

Waveform of the oscilloscope



FRAME REF pulse is in the high level portion of TP702.

Adjustments: RV702/TBC-17P (M-6) or RV1 on DUS-494/TBC-17P

Specifications and adjustment

Step-4

When the SCH of the vectorscope is changed in the range of about +/- 10 degrees, confirm that the CF PULSE changes at the 90 degrees position.

Adjustments: SUBCARRIER control/signal generator

Specifications and adjustment

Step-5

Return the SCH to 0 degree of the vectorscope.

Adjustments: Confirm that "A" period of the waveform at TP702 is High level.

TRIG: FRAME REF/TSG-271

11-8. PB VISC PHASE ADJUSTMENT

. Before performing this adjustment, Step-1 through Step-3 of Section 11-5 should be completed.

Preparations for adjustment

Step-1

- . Playback the composite V-sweep signal portion (28:00 to 30:00) of an alignment tape CR5-1B PS.
- . Set the CAPSTAN LOCK switch on the subcontrol panel to 8FD.
- . Set the DT SELECT switch to OFF.
- . Set switch S1-bit8 on TBC-17P board (J-1) to ON.
- . Connect the VISC tool to MONITOR OUTPUT Y connector on the connector panel.

Specifications and adjustment

Step-1

Y OUT/VISC tool

Picture of the vectorscope (SCH mode)

> Confirm the sync phase of the MONITOR OUTPUT connector on the right position.

Preparations for adjustment

Step-2

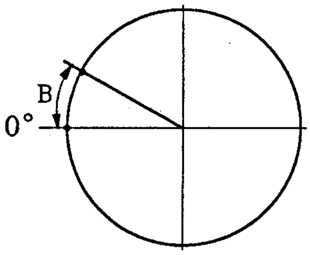
- . Press CH-B button of the vectorscope.

Specifications and adjustment

Step-2

Y OUT/VISC tool

Waveform of the vectorscope (SCH mode)



> B = 0 degree

> Adjustments: PHASE cotrol/vectorscope

Preparations for adjustment

Step-3

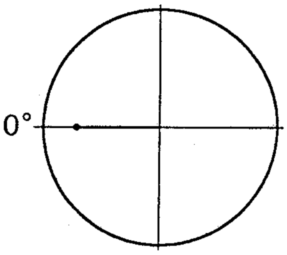
- . Press VECT-CH-B button of the vectorscope.

Specifications and adjustment

Step-3

Y OUT/VISC tool

Waveform of the vectorscope (VECT mode)



> VISC phase: 0 ± 5 degrees
> (Measure the center of the jitter)

> Adjustments: RV706/TBC-17P (P-1)

NOTE: After adjustment is completed, reset the CAPSTAN LOCK switch to 2FD, and switch S1-bit8 on TBC-17P board to OFF.

11-9. NOISE REDUCE ADJUSTMENT

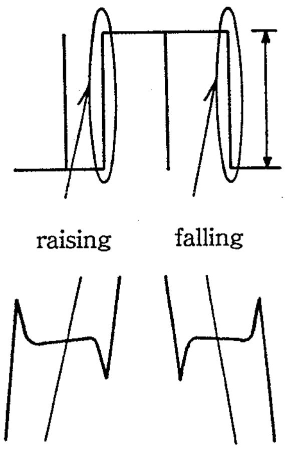
Preparations for adjustment

Step-1

- .Playback a pulse & bar signal portion (11:00 to 14:00) of an alignment tape CR5-1B PS.
- .Set switch S1-bit5 on TBC-17P board to ON.
- .Set VIDEO switch on subcontrol panel to MANUAL.

Specifications and adjustment

Step-1
TP500/TBC-17P (L-1)
Waveform of the oscilloscope



A = 600 ± 20 mVp-p

Adjustment: VIDEO LEVEL control/sub panel

Specifications and adjustment

Step-2
TP500/TBC-17P (L-1)
Waveform of the oscilloscope

Adjust the potentiometer so that the straight lines as shown in the figure are just appeared.

Adjustment: RV708/TBC-17P (R-1)

Specifications and adjustment

Step-3
TP500/TBC-17P (L-1)
Waveform of the oscilloscope

Adjust the falling edge to meet the specification.

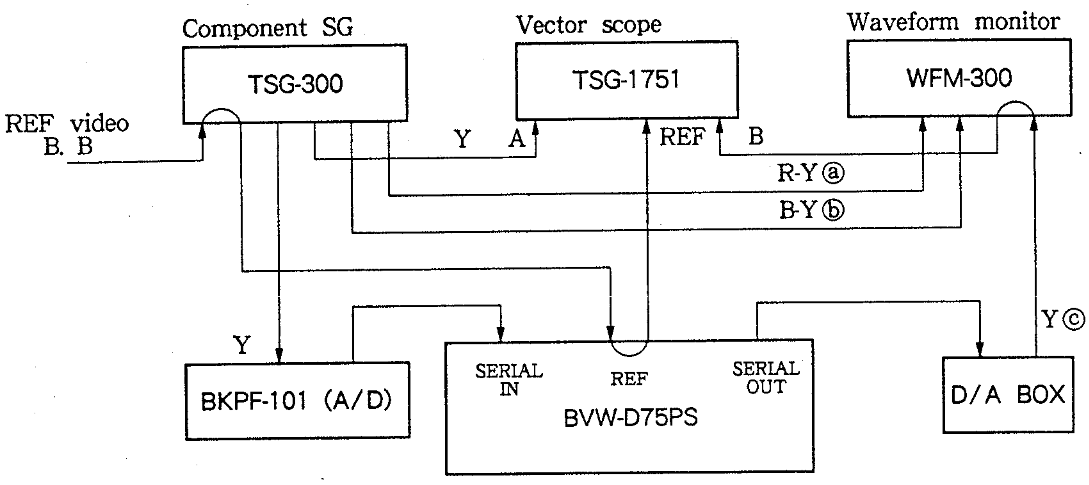
Adjustment: RV709/TBC-17P (P-1)

NOTE: After adjustment is completed, reset S1-bit5 on TBC-17P board to OFF and VIDEO switch on subcontrol panel to PRESET.

TRIG: TP705/TBC-17P (M-5)

11-10. OVERALL VIDEO PHASE ADJUSTMENT

(Connection)


Component SG
TSG-300
Vector scope
TSG-1751
Waveform monitor
WFM-300
REF video
B. B
Y
A
REF
B
R-Yⓐ
B-Yⓑ
Yⓒ
Y
BKPF-101 (A/D)
SERIAL IN
REF
SERIAL OUT
BVW-D75PS
D/A BOX

The connecting cables ⓐ, ⓑ and ⓒ (for R-Y, B-Y and Y signals) should be the same length.

Preparations for adjustment

Step-1

.Supply a 50% bowtie signal to SERIAL V/A INPUT connector.

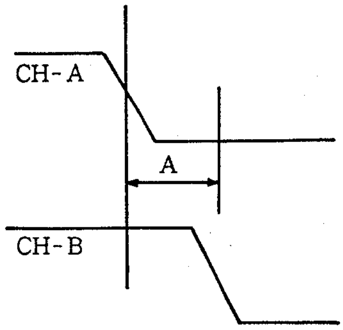
.EE mode

Specifications and adjustment

Step-1

Y OUT/ D/A convertor box.

Waveform of the vectorscope (WFM mode)



A = 0 ± 0.1 us

Coincides the phase on CH-B with that on CH-A when the CH-A and CH-B switches are pressed alternately. (Reference waveform is CH-A.)

Adjustments: SYNC PHASE control/subcontrol panel

Preparations for adjustment

Step-2

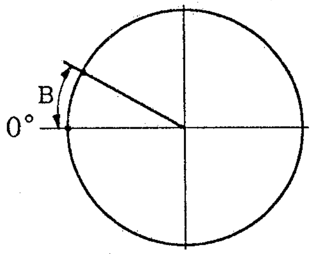
.Press CH-A button of the vectorscope.

Specifications and adjustment

Step-2

Y OUT/Analog component SG

Waveform of the vectorscope (SCH mode)



B = 0 degree

Adjustments: PHASE cotrol/vectorscope

Preparations for adjustment

Step-3

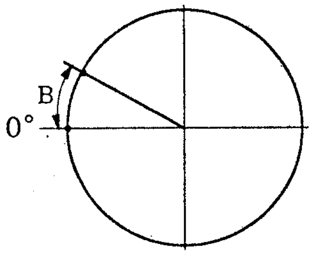
.Press CH-B button of the vectorscope.

Specifications and adjustment

Step-3

Y OUT/ D/A convertor box.

Waveform of the vectorscope (SCH mode)



B = 0 degree

Adjustments: SYNC FINE control/subcontrol panel

Preparations for adjustment

Step-4

.Supply a 50% bowtie signal to SERIAL V/A INPUT connector.

.Set DT SELECT switch to OFF.

.Insert a blank tape BCT-20M (METAL).

.EE mode

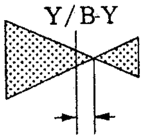
Specifications and adjustment

Step-4

Y OUT connector/ D/A convertor box.

Waveform of the waveform monitor

(Bowtie mode)



Y/B-Y: -5 ± 5 ns

Adjust Y/B-Y delay.

Reference is the B-Y signal of the signal generator.

Adjustments: RV115/DIF-11P (C-5)

Preparations for adjustment

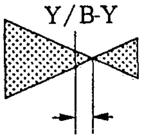
Step-5

.Supply a 50% bowtie signal to SERIAL V/A INPUT connector.
.Set DT SELECT switch to OFF.
.Insert a blank tape BCT-20M (METAL).
.Put the unit into REC mode about 30 seconds.
.Playback the self-recorded portion of the tape.

Specifications and adjustment

Step-5

Y OUT connector/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)



Y/B-Y: 0 ± 10 ns
Adjust the dip point to the center marker.
(Minimize the Y/B-Y deley.)

Adjustments: Confirmation

Preparations for adjustment

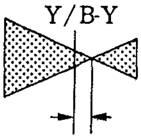
Step-6

.Set DT SELECT switch to VAR.
.Playback the self-recorded portion in Step-5.

Specifications and adjustment

Step-6

Y OUT connector/ D/A convertor box.
Waveform of the waveform monitor

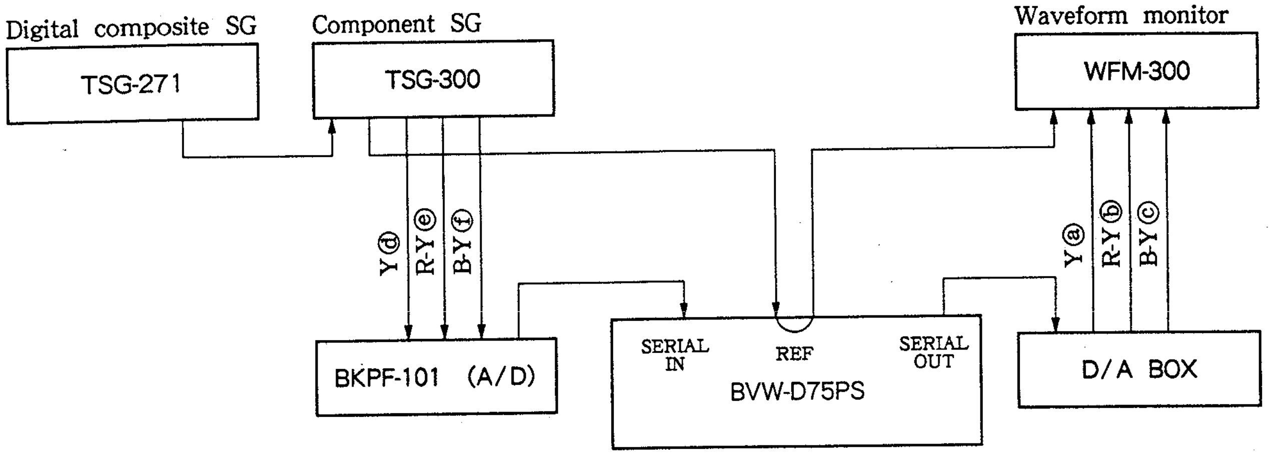


Y/B-Y: 0 ± 10 ns
Adjust the dip point to the center marker.
(Minimize the Y/B-Y deley.)

Adjustments: Confirmation

11-11. OVERALL Y/C DELAY ADJUSTMENT (METAL)

(Connection)


Digital composite SG
TSG-271
Component SG
TSG-300
Waveform monitor
WFM-300
Y ⓓ
R-Y ⓔ
B-Y ⓕ
Y ⓐ
R-Y ⓑ
B-Y ⓒ
BKPF-101 (A/D)
SERIAL IN
REF
SERIAL OUT
BVW-D75PS
D/A BOX

The connecting cables ⓐ through ⓕ should be the same length.

Preparations for adjustment

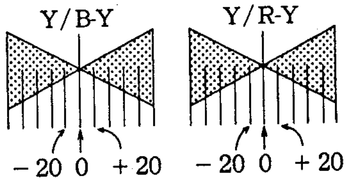
Step-1

- .Supply a 50% bowtie signal to SERIAL V/A INPUT connector.
- .Set DT SELECT switch to OFF.
- .Set CONFI switch to ON.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode.

Specifications and adjustments

Step-1

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)


Y/B-Y
Y/R-Y
-20 0 +20
-20 0 +20

Y/B-Y: 0 ± 10 ns
Y/R-Y: 0 ± 10 ns
B-Y/R-Y: less than 10 ns
Adjust the dip point to the center marker.
(Minimize the Y/R-Y delay and Y/B-Y delay.)

Adjustments: For Y/B-Y
Rough adjustment:
RV112/DIF-11P (C-5)
Fine adjustment:
RV114/DIF-11P (C-5)
For Y/R-Y
Confirmation
For B-Y/R-Y
Confirmation

Preparations for adjustment

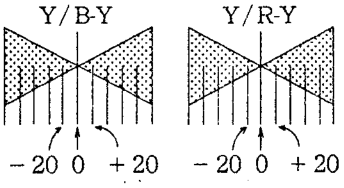
Step-2

- .Supply a 50% bowtie signal to SERIAL V/A INPUT connector.
- .Set DT SELECT switch to OFF.
- .Set CONFI switch to ON.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode again about 30 seconds, and playback the self-recorded portion.

Specifications and adjustment

Step-2

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)



Y/B-Y: 0 ± 10 ns
Y/R-Y: 0 ± 10 ns
B-Y/R-Y: less than 10 ns
Confirm that the Y/B-Y delay, Y/R-Y delay AND B-Y/R-Y delay meet the specifications.

11-12. OVERALL Y/C DELAY ADJUSTMENT (OXIDE)

Preparations for adjustment

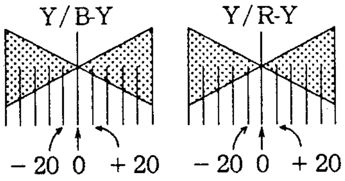
Step-1

- .Supply a 50% bowtie signal to SERIAL V/A INPUT connector.
- .Set DT SELECT switch to OFF.
- .Set CONFI switch to ON.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode.

Specifications and adjustments

Step-1

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)



Y/B-Y: 0 ± 10 ns
Y/R-Y: 0 ± 10 ns
B-Y/R-Y: less than 10 ns
Adjust the dip point to the center marker.
(Minimize the Y/R-Y delay and Y/B-Y delay.)

Adjustments: For Y/B-Y
RV113/DIF-11P (C-5)
For Y/R-Y
Confirmation
For B-Y/R-Y
Confirmation

Preparations for adjustment

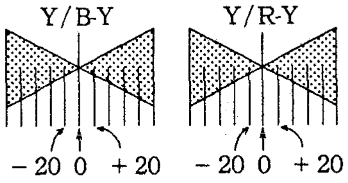
Step-2

- .Supply a 50% bowtie signal to SERIAL V/A INPUT connector.
- .Set DT SELECT switch to OFF.
- .Set CONFI switch to ON.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REc mode again about 30 seconds, and playback the self-recorded portion.

Specifications and adjustments

Step-2

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)



Y/B-Y: 0 ± 10 ns
Y/R-Y: 0 ± 10 ns
B-Y/R-Y: less than 10 ns
Confirm that the Y/B-Y delay, Y/R-Y delay AND B-Y/R-Y delay meet the specifications.

Adjustments: For Y/B-Y Confirmation
For Y/R-Y Confirmation
For B-Y/R-Y Confirmation

11-13. OVERALL CHARACTERISTICS CHECK

11-13-1. PB Video Level Check (Metal)

Preparations for adjustment

.Playback the 100% color-bar signal portion (14:00 to 17:00) of an alignment tape CR5-1B PS.

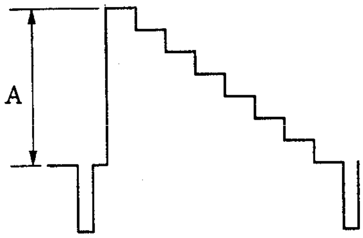
.Set a DT SELECT switch to OFF.

Specifications

Y, R-Y and B-Y OUTPUT/ D/A convertor box.

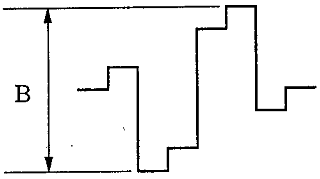
Y OUT
Waveform of the waveform monitor

A = 700.0 ± 10.5 mVp-p



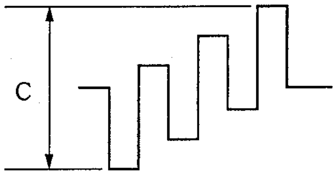
R-Y OUT
Waveform of the waveform monitor

B = 700.0 ± 10.5 mVp-p



B-Y OUT
Waveform of the waveform monitor

C = 700.0 ± 10.5 mVp-p



11-13-2. PB Video Level Check (Oxide)

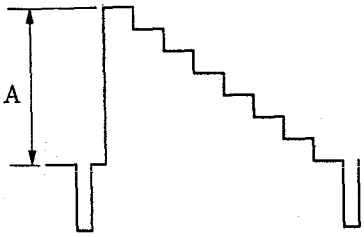
Preparations for adjustment

- .Playback the 75% color-bar signal portion (0:00 to 3:00) of an alignment tape CR5-2A PS.
- .Set a DT SELECT switch to OFF.

Specifications

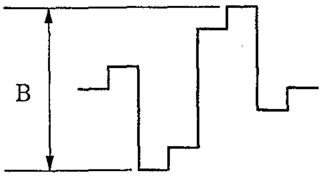
Y, R-Y and B-Y OUTPUT/ D/A convertor box.

Y OUT
Waveform of the waveform monitor



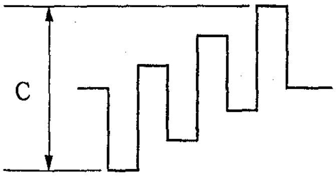
A = 700.0 ± 10.5 mVp-p

R-Y OUT
Waveform of the waveform monitor



B = 525 ± 7 mVp-p

B-Y OUT
Waveform of the waveform monitor



C = 525 ± 7 mVp-p

11-13-3. EE Video level Check (Metal)

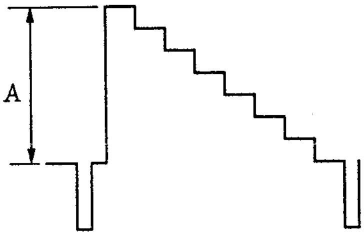
Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .Set a DT SELECT switch to OFF.
- .EE mode

Specifications

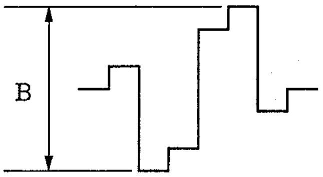
Y, R-Y and B-Y OUTPUT/ D/A convertor box.

Y OUT
Waveform of the waveform monitor



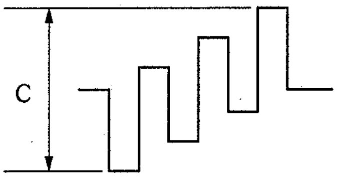
A = 700.0 ± 10.5 mVp-p

R-Y OUT
Waveform of the waveform monitor



B = 700.0 ± 10.5 mVp-p

B-Y OUT
Waveform of the waveform monitor



C = 700.0 ± 10.5 mVp-p

11-13-4. EE Video level Check (Oxide)

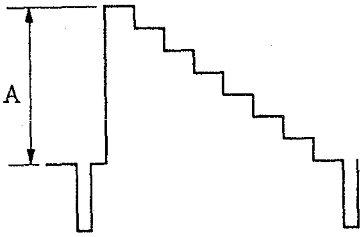
Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20G (OXIDE).
- .Set a DT SELECT switch to OFF.
- .EE mode

Specifications

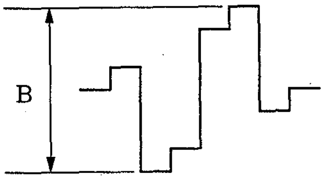
Y, R-Y and B-Y OUTPUT/ D/A convertor box.

Y OUT
Waveform of the waveform monitor



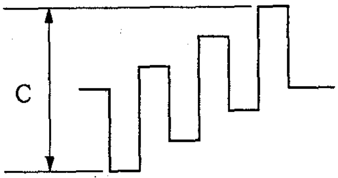
A = 700.0 ± 10.5 mVp-p

R-Y OUT
Waveform of the waveform monitor



B = 700.0 ± 10.5 mVp-p

B-Y OUT
Waveform of the waveform monitor



C = 700.0 ± 10.5 mVp-p

11-13-5. Y PB Video Frequency Response Check (Metal)

Preparations for adjustment

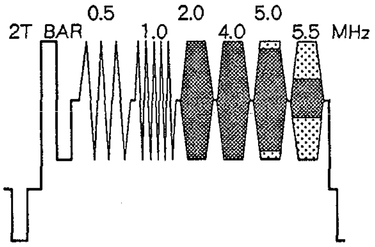
Step-1

- .Playback a multi burst signal portion (8:00 to 11:00) of an alignment tape CR5-1B PS.
- .Set a DT SELECT switch to OFF.

Specifications

Step-1

Y OUT/ D/A convertor box.
Waveform of the waveform monitor



2T BAR : Referense (100%)
0.5 MHz : 0 ± 0.4 dB
1.0 MHz : 0 ± 0.4 dB
2.0 MHz : 0 ± 0.4 dB
4.0 MHz : 0 ± 0.4 dB
5.0 MHz : 0 +0.4/-1.0 dB
5.5 MHz : -1.5 +1.5/-1.0 dB

Preparations for adjustment

Step-2

- .Play back a 60% multi burst signal portion (8:00 to 11:00) of an alignment tape CR5-1B.
- .Set a DT SELECT switch to VAR.

Specifications

Step-1

Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Specifications are the same as Step-1.

11-13-6. C PB Video Frequency Response Check (Metal)

Preparations for adjustment

Step-1

.Playback a multi burst signal portion (8:00 to 11:00) of an alignment tape CR5-1B PS.

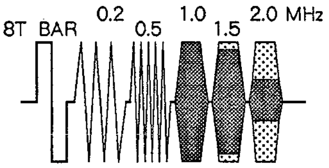
.Set a DT SELECT switch to OFF.

Specifications

Step-1

R-Y and B-Y OUT connectors/ D/A convertor box.

Waveform of the waveform monitor



Confirm the R-Y and B-Y frequency response. The frequency response for R-Y and B-Y are the same specification.

8T BAR : Referense (100%)
0.2 MHz : 0 ± 0.4 dB
0.5 MHz : 0 ± 0.4 dB
1.0 MHz : 0 ± 0.4 dB
1.5 MHz : ---
2.0 MHz : -2.0 +2.0/-0.8 dB

Preparations for adjustment

Step-2

.Playback a multi burst signal portion (8:00 to 11:00) of an alignment tape CR5-1B PS.

.Set a DT SELECT switch to VAR.

Specifications

Step-2

R-Y and B-Y OUT/ D/A convertor box.

Waveform of the waveform monitor

Confirm the R-Y and B-Y frequency response. Specifications are the same as Step-1.

11-13-7. Y PB Video Frequency Response Check (Oxide)

Preparations for adjustment

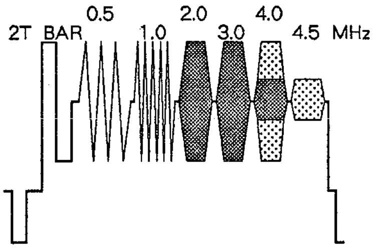
Step-1

- .Playback a 60% multi burst signal portion (3:00 to 6:00) of an alignment tape CR5-2A PS.
- .Set a DT SELECT switch to OFF.

Specifications

Step-1

Y OUT/ D/A convertor box.
Waveform of the waveform monitor



2T BAR : Referense (100%)
0.5 MHz : 0 ± 0.4 dB
1.0 MHz : 0 ± 0.4 dB
2.0 MHz : -2.0 +/- 0.5 dB
3.0 MHz : -1.0 ± 1.0 dB
4.0 MHz : -3.0 ± 2.5 dB

Preparations for adjustment

Step-2

- .Playback a 60% multi burst signal portion (3:00 to 6:00) of an alignment tape CR5-2A PS.
- .Set a DT SELECT switch to VAR.

Specifications

Step-1

Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Specifications are the same as Step-1.

11-13-8. C PB Video Frequency Response Check (Oxide)

Preparations for adjustment

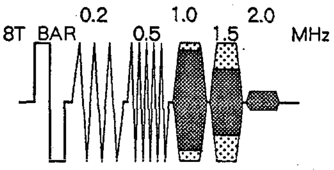
Step-1

- .Playback a 60% multi burst signal portion (3:00 to 6:00) of an alignment tape CR5-2A PS.
- .Set a DT SELECT switch to OFF.

Specifications

Step-1

R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor



Confirm the R-Y and B-Y frequency response.
The specifications of the frequency response for R-Y and B-Y are the same.

8T BAR : Referense (100%)
0.2 MHz : 0 ± 0.4 dB
0.5 MHz : 0 ± 0.4 dB
1.0 MHz : -0.5 ± 0.9 dB
1.5 MHz : -1.2 ± 1.2 dB
2.0 MHz : ----

Preparations for adjustment

Step-2

- .Playback a 60% multi burst signal portion (3:00 to 6:00) of an alignment tape CR5-2A PS.
- .Set a DT SELECT switch to VAR.

Specifications

Step-2

R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Confirm the R-Y and B-Y frequency response.
Specifications are the same as Step-1.

11-13-9. Y Overall Video Frequency Response Check (Metal)

Preparations for adjustment

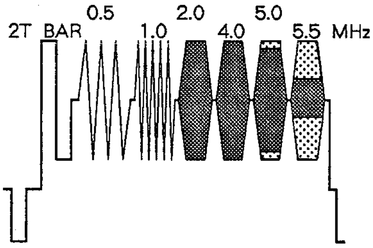
Step-1

.Supply a 60% multi burst signal (WIDE) to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20M (METAL).
.Set a DT SELECT switch to OFF.
.Put the unit into REC mode, and playback the self-recorded portion.

Specifications

Step-1

Y OUT/ D/A convertor box.
Waveform of the waveform monitor



2T BAR : Referense (100%)
0.5 MHz : 0 ± 0.4 dB
1.0 MHz : 0 ± 0.4 dB
2.0 MHz : 0 ± 0.4 dB
4.0 MHz : 0 ± 0.4 dB
5.0 MHz : 0 +0.4/-1.0 dB
5.5 MHz : -1.5 +1.5/-1.0 dB

Preparations for adjustment

Step-2

.Set a DT SELECT switch to VAR.
.Playback the self-recorded portion.

Specifications

Step-2

Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Specifications are the same as Step-1.

11-13-10. C Overall Video Frequenct Response Check (Metal)

Preparations for adjustment

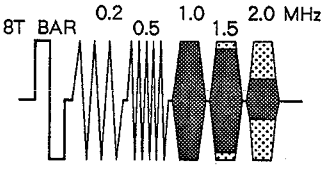
Step-1

.Supply a 60% multi burst signal to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20M (METAL).
.Set a DT SELECT switch to OFF.
.Put the unit into REC mode, and playback the self-recorded portion.

Specifications

Step-1

R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor



Confirm the R-Y and B-Y frequency response.

8T BAR : Referense (100%)
0.2 MHz : 0 ± 0.4 dB
0.5 MHz : 0 ± 0.4 dB
1.0 MHz : 0 ± 0.4 dB
1.5 MHz : ---
2.0 MHz : -2.0 +2.0/-0.8 dB

Preparations for adjustment

Step-2

.Set a DT SELECT switch to VAR.
.Playback the self-recorded portion.

Specifications

Step-2

R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Confirm the R-Y and B-Y frequency response.
Specifications are the same as Step-1.

11-13-11. Y Overall Video Frequency Response Check (Oxide)

Preparations for adjustment

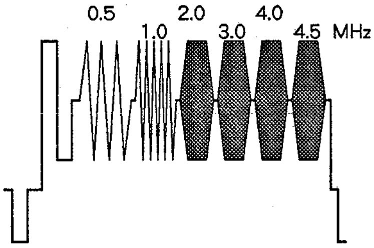
Step-1

.Supply a 60% multi burst signal (NARROW) to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20G (OXIDE).
.Set a DT SELECT switch to OFF.
.Put the unit into REC mode, and playback the self-recorded portion.

Specifications

Step-1

Y OUT/ D/A convertor box.
Waveform of the waveform monitor



Confirm the Y frequency response.

2T BAR : Referense (100%)
0.5 MHz : 0 ± 0.4 dB
1.0 MHz : 0 ± 0.4 dB
2.0 MHz : -0.2 ± 0.5 dB
3.0 MHz : -1.0 ±1.0 dB
4.0 MHz : -3.0 ± 2.5 dB

Preparations for adjustment

Step-2

.Set a DT SELECT switch to VAR.
.Playback the self-recorded portion.

Specifications

Step-2

Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Confirm the Y frequency response.
Specifications are the same as Step-1.

11-13-12. C Overall Video Frequenct Response Check (Oxide)

Preparations for adjustment

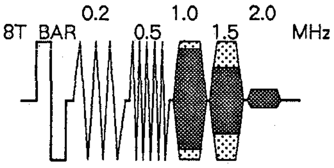
Step-1

- .Supply a 60% multi burst signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20G (OXIDE).
- .Set a DT SELECT switch to OFF.
- .Put the unit into REC mode, and playback the self-recorded portion.

Specifications

Step-1

R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor



Confirm the R-Y and B-Y frequency response.

8T BAR : Referense (100%)
0.2 MHz : 0 ± 0.4 dB
0.5 MHz : 0 ± 0.4 dB
1.0 MHz : -0.5 ± 0.9 dB
1.5 MHz : -1.2 +1.2/-1.5 dB
2.0 MHz : ----

Preparations for adjustment

Step-2

- .Set a DT SELECT switch to VAR.
- .Playback the self-recorded portion.

Specifications

Step-2

R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Confirm the R-Y and B-Y frequency response.
Specifications are the same as Step-1.

11-13-13. PB Y/C Delay Check (Metal)

Preparations for adjustment

Step-1

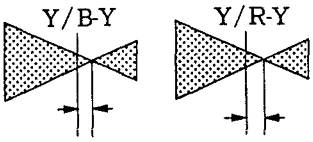
.Set a DT SELECT switch to OFF.

.Playback a 50% bowtie & 10T signal portion (17:00 to 19:00) of an alignment tape CR5-1B PS.

Specifications

Step-1

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)



Confirm the Y/C and C/C delay.

Y/R-Y : 0 ± 18 ns
Y/B-Y : 0 ± 18 ns
R-Y/B-Y : less than 18 ns

Preparations for adjustment

Step-2

.Set a DT SELECT switch to VAR.

.Playback a 50% bowtie & 10T signal portion (17:00 to 19:00) of an alignment tape CR5-1B PS.

Specifications

Step-2

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Confirm the Y/C and C/C delay.
Specifications are the same as Step-1.

11-13-14. PB Y/C Delay Check (Oxide)

Preparations for adjustment

Step-1

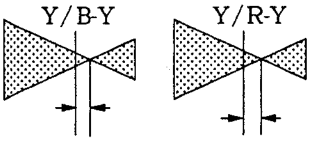
.Set a DT SELECT switch to OFF.

.Playback a 50% bowtie & 10T signal portion (6:00 to 9:00) of an alignment tape CR5-2A PS.

Specifications

Step-1

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)



Confirm the Y/C and C/C delay.

Y/R-Y : 0 ± 18 ns
Y/B-Y : 0 ± 18 ns
R-Y/B-Y : less than 18 ns

Preparations for adjustment

Step-2

.Set a DT SELECT switch to VAR.

.Playback a 50% bowtie & 10T signal portion (6:00 to 9:00) of an alignment tape CR5-2A PS.

Specifications

Step-2

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Confirm the Y/C and C/C delay.
Specifications are the same as Step-1.

11-13-15. Overall Y/C Delay Check (Metal)

Preparations for adjustment

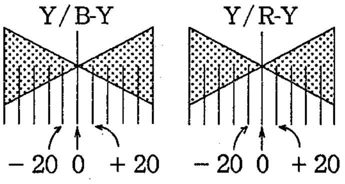
Step-1

- .Supply a 50% bowtie signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode about 30 seconds, andplay back the self-recorded portion.
- .Set the DT SELECT switch to OFF.

Specifications

Step-1

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)



Confirm the Y/C and C/C delay.

Y/R-Y : 0 ± 18 ns
Y/B-Y : 0 ± 18 ns
R-Y/B-Y : less than 18 ns

Preparations for adjustment

Step-2

- .Set a DT SELECT switch to VAR.
- .Playback the self-recorded portion.

Specifications

Step-2

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Confirm the Y/C and C/C delay.
Specifications are the same as Step-1.

11-13-16. Overall Y/C Delay Check (Oxide)

Preparations for adjustment

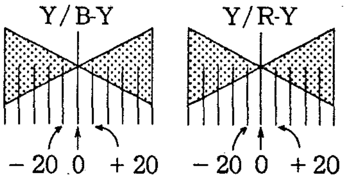
Step-1

- .Supply a 50% bowtie signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20G (OXIDE).
- .Put the unit into REC mode about 30 seconds, and playback the self-recorded portion.
- .Set the DT SELECT switch to OFF.

Specifications

Step-1

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor
(Bowtie mode)



Confirm the Y/C and C/C delay.

Y/R-Y : 0 ± 18 ns
Y/B-Y : 0 ± 18 ns
R-Y/B-Y : less than 18 ns

Preparations for adjustment

Step-2

- .Set a DT SELECT switch to VAR.
- .Playback the self-recorded portion.

Specifications

Step-2

Y, R-Y and B-Y OUT/ D/A convertor box.
Waveform of the waveform monitor

Confirm the Y/C and C/C delay.
Specifications are the same as Step-1.

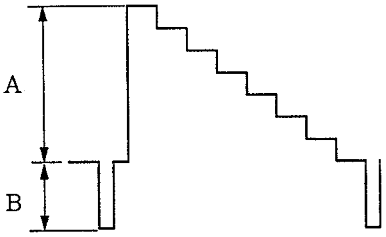
11-13-17. Monitor EE Video Level Check

Preparations for adjustment

- .Supply a 100% color-bar signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .Set a DT SELECT switch to OFF.
- .EE mode

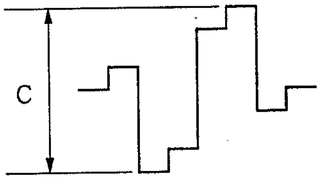
Specifications

MONITOR OUTPUT (Y, R-Y and B-Y)/connector panel
Waveform of the waveform monitor



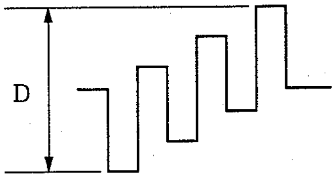
A = 700.0 ± 10.5 mVp-p
B = 300.0 ± 4.5 mVp-p

R-Y OUT
Waveform of the waveform monitor



C = 700.0 ± 10.5 mVp-p

B-Y OUT
Waveform of the waveform monitor



D = 700.0 ± 10.5 mVp-p

Confirm that the level difference between R-Y and B-Y is less than 10.5 mVp-p.

11-13-18. Monitor Y Overall Video Frequency Response Check

Preparations for adjustment

Step-1

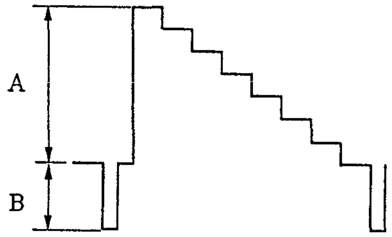
- .Supply a 60% multi burst signal (WIDE) to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .Set a DT SELECT switch to OFF.
- .Put the unit into REC mode, and playback the self-recorded portion.

Specifications

Step-1

MONITOR OUTPUT Y/connector panel
Waveform of the waveform monitor

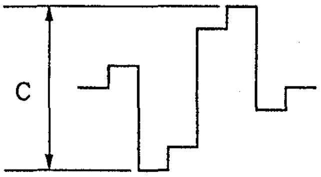
2T BAR : Referense (100%)
0.5 MHz : 0 ± 0.7 dB
1.0 MHz : 0 ± 0.7 dB
2.0 MHz : 0 ± 0.7 dB
4.0 MHz : 0 ± 0.7 dB
5.0 MHz : 0 +0.7/-1.5 dB
5.5 MHz : -1.5 ± 2.0 dB



Preparations for adjustment

Step-2

- .Set a DT SELECT switch to VAR.
- .Playback the self-recorded portion.

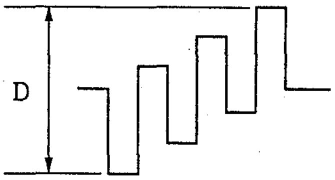


Specifications

Step-2

MONITOR OUTPUT Y/connector panel
Waveform of the waveform monitor

Specifications are the same as Step-1.



11-13-19. Monitor C Overall Video Frequency Response Check

Preparations for adjustment

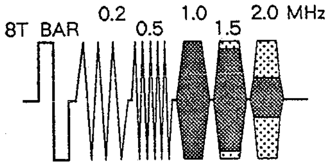
Step-1

.Supply a 60% multi burst signal to SERIAL V/A INPUT connector.
.Insert a blank tape BCT-20M (METAL).
.Set a DT SELECT switch to OFF.
.Put the unit into REC mode, and playback the self-recorded portion.

Specifications

Step-1

MONITOR OUTPUT R-Y and B-Y/connector panel
Waveform of the waveform monitor



Confirm the R-Y and B-Y frequency response.

8T BAR : Referense (100%)
0.2 MHz : 0 ± 0.7 dB
0.5 MHz : 0 ± 0.7 dB
1.0 MHz : 0 ± 0.7 dB
1.5 MHz : ---
2.0 MHz : -2.0 +2.0/-1.5 dB

Preparations for adjustment

Step-2

.Set a DT SELECT switch to VAR.
.Playback the self-recorded portion.

Specifications

Step-2

MONITOR OUTPUT R-Y and B-Y/connector panel
Waveform of the waveform monitor

Confirm the R-Y and B-Y frequency response.
Specifications are the same as Step-1.

11-13-20. Monitor Overall Y/C Delay Check

Preparations for adjustment

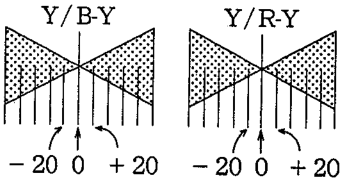
Step-1

- .Supply a 50% bowtie signal to SERIAL V/A INPUT connector.
- .Insert a blank tape BCT-20M (METAL).
- .Put the unit into REC mode about 30 seconds, and playback the self-recorded portion.
- .Set the DT SELECT switch to OFF.

Specifications

Step-1

MONITOR OUTPUT (Y, R-Y and B-Y)/connector panel
Waveform of the waveform monitor
(Bowtie mode)



Confirm the Y/C and C/C delay.

Y/R-Y : 0 ± 18 ns
Y/B-Y : 0 ± 18 ns
R-Y/B-Y : less than 18 ns

Preparations for adjustment

Step-2

- .Set a DT SELECT switch to VAR.
- .Playback the self-recorded portion.

Specifications

Step-2

MONITOR OUTPUT (Y, R-Y and B-Y)/connector panel
Waveform of the waveform monitor

Confirm the Y/C and C/C delay.
Specifications are the same as Step-1.